COMPUTERWORLD

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Faster 360/20 Due in '69; Model 25 Now 'Compatible'

WHITE PLAINS, N.Y. – A new version of the System 360 Model 20 and a feature that allows Model 20 programs – including the multifunction card machine – to be run on the more powerful Model 25, have been announced by IBM for delivery in the second quarter of next year.

The new Model 20 can have 32K bytes (as opposed to the previous 16K maximum) and provides for more overlapping and considerably faster internal execution. The price for the system was estimated by IBM to be about 3% to 8% higher than for the original Model 20.

The increased internal speed of the new Model 20 is achieved primarily by a faster main memory. The memory has a cycle time of two microseconds for two bytes of data. This compares to 3.6 microseconds for a single byte in the original Model 20.

Also contributing to the speed increase is a small "scratch pad" memory. This unit, containing high speed monolithic circuits, reduces the time needed to store and retrieve data during a computation. It also allows overlapping of tape, disk, and high speed communications with internal processing and other input/output operations.

The new version of the Model 20 was developed at the IBM laboratories in Germany and is being manufactured in Fla.

Runs on Model 25

The growth feature for Model 20 users moving up to the Model 25 allows the larger system to operate at approximately four times the internal speed of the original Model 20s (or 30% faster than the new Model 20s) without reprogramming. In addition, the feature permits the use of the IBM 2560 multifunction card machine with the Model 25. However, this can be used only when Model 20 style programming is involved.

Competition From Honeywell

This more powerful system comes shortly after Honeywell has launched a liberation campaign directly at 360/20 users. The campaign emphasized the high percentage of users who were involved primarily or exclusively in RPG software and conversion is being handled by a special RPG to Cobol translator. The difference in performance was a major Honeywell sales point which presumably is likely to be undercut by the new systems.

Comparative Model 20 Processor Prices

	Submodels 3		Original Model 20s		New Model 20s	
8K	$16,600	($365 /mo.)	$23,570	($515 /mo.)	$ 45,600	($ 900 /mo.)
12K	$28,100	($625 /mo.)	$44,230	($980 /mo.)	$ 58,000	($1160 /mo.)
16K	$34,900	($785 /mo.)	$55,100	($1235 /mo.)	$ 72,800	($1415 /mo.)
24K	Not available		Not available		$ 91,700	($1765 /mo.)
32K	Not available		Not available		$107,800	($2115 /mo.)

Prices of comparable Model 20 processors. Submodel 3s have a performance of approximately 70%, and the new submodel 5s have an internal performance of approximately 300% of the original Model 20s.

J. Stanford Smith, GE vice president, will keynote the DPMA conference.

'68 DPMA Show Ready to Open In Washington

WASHINGTON, D.C. – When the Data Processing Management Association conference opens here Tuesday, June 25, it will be another case of the tail wagging the dog.

While an estimated 35,500 persons will visit the business exposition held in conjunction with the conference, only 3500 of them are expected to attend the seminars. While the many are staring at the newest EDP equipment, only the few will be listening to experts report on how to evaluate them and to use them efficiently.

The four-day conference at the Washington Hilton Hotel will run through Friday, June 28.

The seminar program will provide a "short course" concept in education, permitting registrants to select the seminar series of greatest individual interest, and to participate in sessions offering an in-depth analysis of new technical applications. Seminar series are scheduled for three consecutive time periods beginning Wednesday afternoon and concluding Thursday. The closing day of the conference will offer a selection of elective seminars, some of them repeats of the more popular series offerings and the others covering topics of general interest.

Keynote speaker J. Stanford Smith, vice president and group executive of General Electric and general manager of the Information Systems Group, will address the delegates on the "Growing Maturity of the Computer Age" at the Conference General Assembly Wednesday morning.

A special conference feature will be the appearance of Newsweek magazine's Periscope Panel at the Wednesday luncheon.

An annual feature of the conference, a series of tours to computer installations in the area, will include visits to the National Aeronautics and Space Administration; the Social Security Administration; the Government Employees Insurance Co.; the [illegible] Department of Commerce, National [illegible] of Standards; the Suburban Trust [illegible]; a[illegible] the National Brewing Co.

A highlight of the conference will be the

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Brooks Queries DOD Procurement

WASHINGTON, D.C. – In a letter to the secretary of defense, the secretaries of the Army, Navy, and Air Force, and the commandant of the Marine Corps, Rep. Jack Brooks of Texas has attacked the apparent organization of the procurement for the National Military Command System on the ground that it was being unnecessarily restrictive and, like the recent Air Force Phase II, would cause many small and large firms not to submit bids. Quoting the President's announcement earlier this year adopting the USASI code for data interchange as a federal standard and bringing out the recent Navy developments for testing Cobol compilers, he suggested that the procurement be split up and asked that the various officials respond at their earliest convenience to the Government Activities Subcommittee which Brooks heads.

The text of his letter appears on page 2.

Computer Sciences to Set Up 20 Time Share Utility Centers

LOS ANGELES – Computer Science Corp. is the latest entry in the time sharing utility sweepstakes, with plans to open time sharing centers in 20 cities at a cost of $50 million.

CSC's first customers may be members of the Associated Credit Bureaus of America. Negotiations are under way, it was announced by William R. Hoover, president of CSC's computer sciences division, and John L. Spafford of Houston, executive vice president of the credit bureau association.

The association has developed a software package which is already available to its members. Plans call for CSC centers to offer this package to area credit bureaus.

"Widespread use of computer systems by individual credit bureaus would make a substantial contribution to protection of consumer privacy," Hoover said. "We propose to work closely with credit bureau industry leaders to guarantee safeguards of privacy to the consumer while offering the public the most advanced techniques available for the interchange of credit information."

CSC will open the first regional computer center in the last quarter of 1968, with the remaining 19 being opened at the rate of one a month, the company said.

United States and Canadian cities in which CSC will establish centers are Atlanta, Boston, Buffalo, Calgary, Chicago, Cincinnati, Dallas, Denver, Detroit, Los Angeles, Minneapolis, Montreal, New York, Orlando, Philadelphia, Pittsburgh, St. Louis, San Francisco, Seattle, and Washington, D.C.

SCS now operates a remote batch processing network serving more than 150 organizations in the western United States and Canada.

EDP Stocks Down First Time in Month

CW's Computer Stock Index fell for the first time in a month as the stock market eased off slightly last week. The index was off 2.62% to 149, while the Dow Jones industrial average lost only 0.11%, standing at 914 on Friday's close. Losers outnumbered gainers two-to-one among computer stocks.

Only two stocks in the Computer System sector managed to gain ground during the week. Collins Radio rose 7% to 70-5/8 and Hewlett-Packard gained 0.84% to 89-3/4, after setting a new high of 91-3/8. Scientific Control Corp. showed the second largest loss on the table, falling 19% to 54. SCC still stands 140% above the March 1 base price. Sperry Rand lost 8% to 55; Digital Equipment, 7% to 138-1/4; and Raytheon, 6% to 99-1/2.

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The Ampex TM-16 tape transport is plug-for-plug compatible with IBM computers.

Another Firm Entering IBM Peripheral Market

NEW YORK – Another leasing firm has followed MAI into the computer peripheral business and intends to provide Ampex plug-in 800bpi tape units for users of IBM systems. Harvey Goodman, president of Data Processing Financial and General Corp. (DPF&G) said that they were convinced that the Ampex drive has the most efficient performance characteristics of any tape drive currently being produced and that they believe they can sell $15 million worth of the equipment in the first year with substantial increments later.

The servicing of the Ampex equipment will continue to be handled by Ampex. Ampex salesmen will continue to sell the drives to their own users. Ampex spokesmen said that the reason for the agreement was that DPF&G already had substantial contacts with installations.

Upgradable Unit

The Ampex unit is a single capstan tape transport which can run on either IBM 1400, 7000, or 360 systems. It can be upgraded from a 729 equivalent to a 2400 equivalent when a central processor change is involved. The data transfer speeds are from 60 to 120,000 characters per second with a rate of 75 to 150 inch/second speeds.

Considerable emphasis is placed on the rewind operation when the tape is not removed from the vacuum chambers as it is in the standard IBM systems. Ampex believes that this assures safe storage of tapes as a result of controlled tension always being applied during the rewind process.

DPF&G spokesmen told *Computerworld* that the performance of the Ampex tape units was superior to that of the equivalent IBM ones. "It can read tapes which the IBM drives are rejecting, so it has less down time," Goodman said after inspecting the reports from test sites.

The interchannel time displacement area which is held to two microseconds or less, the tape path which keeps the oxide surface of the tape in sliding contact with the only rewrite head, and the tape cleaner are features which are also emphasized.

No IBM Problem Anticipated

DPF&G is not worried about any problems with IBM in interconnecting its tape drives to the IBM systems. Goodman told *Computerworld* that if they found that they had any difficulty in marketing the drives they would proceed, under the Sherman Antitrust Act, against IBM. "And it won't be any light matter for IBM," he said.

"If we take five years in the courts to get a decision, we are building up damages throughout the five years – and the Sherman Act demands that triple damages are paid! It could well come to a multi-billion dollar bill at the end of the period."

Data Reader Reads MT/ST Cartridges Into 360

DAYTON, Ohio – A competitor to the recently announced but not yet delivered IBM 2495 tape cartridge reader was unveiled here by Data Products Corp. last week. The new TR 6708 Data Reader reads the magnetic tape cartridges from the IBM Magnetic Tape Selectric Typewriter directly into IBM 360 systems via the multiplexer channel. The unit was developed for the Rand Corporation, and the first unit is due to be delivered there in a few weeks. It is currently operating in Dayton.

Particular features of the unit are the speeds of read-in and rewind – each of which takes only 15 seconds. Unlike the 2495, the TR 6708 holds only one cartridge at a time, but this was explained by a company spokesman as being satisfactory because the normal loading of the unit is not heavy. "A typist takes quite a long time to create those 24,000 character tapes," he said, "and our present experience is that for the MT/ST user the automatic loading of one cartridge after another is not necessary."

Unusual Pricing

The pricing and support of the new unit are somewhat unusual. The purchase price, at $11,845, is considerably below the IBM unit – but the rental price of $390.89 per month is above it. However, the rental rate continues for only three years, and then drops to $390 a year.

Data Products is providing software support to handle the transition of the MT/ST code into 360 code. Currently this is being handled by reading the whole tape into the system and then translating it in place in core before transferring it to wherever is appropriate. Another program under development, however, allows the input to be broken down into smaller portions to economize in core use.

TR 6708 Data Reader

Maintenance of the hardware is currently to be handled by Data Products, but negotiations are underway with one of the major nationwide maintenance contractors to provide more flexible facilities as more and more units are installed.

Delivery is currently two months from order.

Brooks Queries Military Chiefs on Procurement

Below is the text of the letter which Rep. Jack Brooks of Texas sent to Defense Secretary Clark Clifford, Army Secretary Stanley R. Resor, Navy Secretary Paul R. Ingatius, Air Force Secretary Harold Brown, and Marine Corps Commandant Leonard F. Chapman (see story on page 1).

For a number of years this subcommittee has been concerned with the management and utilization of computers in the federal government. Following approval of Public Law 89-306 in October 1965, to coordinate government computer management on a business-like basis, the question of computer standardization has received our particular attention. Breakthroughs in this area have great potential for increased operational efficiency as well as tremendous savings in tax funds.

Under Public Law 89-306, the National Bureau of Standards is given primary responsibility for computer standardization efforts within the federal government. However, in the approval of this legislation, we recognized that other departments and agencies would cooperate and assist in these efforts. The Department of Defense, as the dominant user of computers and which historically has made many contributions to computer development, was expected to play a significant role in standardization developments.

During the past several months, Norman Ream, the special assistant to the secretary of the Navy, has kept me abreast of the work Commander Grace Hopper and other members of his staff are performing in the area of computer language standardization. Commander Hopper, one of the nation's leading computer language experts, with the assistance of a small staff of specialists and the cooperation of the Air Force, Army, the computer manufacturers, and others, has developed techniques to test the software of computer manufacturers – to determine whether the software (compilers) complies with the specifications for the standard programming language, Cobol.

This work in the Navy is a vitally important step in achieving application programs that are not related to and are not dependent upon computer hardware of a particular model or manufacturer, a goal the Defense Department has sought since its early sponsorship of Cobol for administrative applications, as well as Jovial, which has unique command and control applications. Machine independence would stimulate competition within the computer industry. Most important, and among other significant benefits, the Defense Department, the federal government as a whole, as well as business and industry, would obtain broader flexibility in computer selection – even to the selection of a "mix" of computers of different manufacturers to accomplish the same basic application or mission.

Large procurements in the government have generally gone to a single supplier in the past, thereby limiting the government's opportunity to capitalize on the broadest possible range of competition. In the case of the recent Air Force Phase II procurement, for example, only four computer manufacturers offered proposals, and companies such as Univac, GE, and Control Data, among others, did not even compete.

I understand that later this fall a large procurement is proposed for the National Military Command System. It appears probable that this procurement will involve computers of different sizes to meet differing workloads at the various echelons at which they will be installed. If commonality in data interchange and programs could be established by Defense, and compliance could be assured, then the possibility of segmenting this large order to encourage competition could be achieved.

Not only could the giants of the computer industry compete, whose products cover the entire computer range, but those companies whose products fit within specific ranges would have fair and equal opportunity to participate for those portions of the system requiring computers of the capability they market. Such a result would be of obvious benefit to both the computer industry and the government.

Presumably, at this time the procurement of the National Military Command System is oriented in the direction of a single vendor. Yet this need not be the case. The President's announcement of March 11, 1968, adopting the USASI code for data interchange as a federal standard will apply to this new procurement and provide the necessary commonality in data interchange. Furthermore, the Navy's techniques devised for testing Cobol compilers would seem to be equally applicable to Jovial, the language I understand will be used in this new command and control system. Hence, the opportunity for splitting this procurement.

I therefore suggest that immediate consideration be given to adapting Jovial as the Navy has done with Cobol. This project probably could be accomplished under the direction of Norman Ream and Commander Grace Hopper.

I believe such an approach would be consistent with the objectives of Congress, as manifested in Public Law 89-306, and conform to the computer management philosophy of the President, as expressed in his memorandum of June 28, 1966. It should also materially assist in the long-term efforts of the Department of Defense to achieve commonality and machine independence of computers – a matter of paramount importance to our defense efforts. Certainly, this is the time, if it is in any way possible, to free this vital defense system from the need for future mammoth reprogrammings incidental to updating computer hardware.

The subcommittee would appreciate your reaction to this proposal at your earliest convenience.

In closing, the department deserves the highest praise for the work that Norman Ream, Dr. Hopper, and the other members of the Navy staff have done. Aside from further efforts that are to be undertaken, the work in Cobol that has been completed is, in itself, a distinct achievement.

Sincerely,

Jack Brooks
Chairman

Government Activities
Subcommittee

Spectra 70s Sold In Canada by RCA

MONTREAL, Canada – RCA will market a full line of Spectra 70 computers in Canada through its subsidiary, RCA Victor Co., Ltd.

"Establishment of an information systems headquarters in Montreal will mark RCA's entry into a computer market which is increasing at a rate nearly double that of the United States," said John D. Houlding, president of RCA Victor Co., Ltd.

Richard J. Campbell has been appointed manager of the new RCA marketing activity. Campbell was formerly project manager of the Spectra 70 Time Sharing System for the RCA Information Systems Division in Cherry Hill, N.J.

Bureaus Need Standards: Brandon

NEW YORK – Data processing service organizations have failed to provide really honest, fair, and effective customer services, Dick H. Brandon, president of Brandon Applied Systems, Inc., told the annual conference of the Association of Data Processing Service Organizations.

Opening the conference, held here last week, Brandon said, "Our reputations have been tarnished by a lack of management, inadequate management practices, and the large number of charlatans whom we have allowed to enter the field."

Brandon called upon ADAPSO to lead the way in developing standards, disciplines, reasonable customer protection devices, and better management practices for the data processing service industry.

New Unit Checks Timing

The small box on the back of this equipment is a new testing device developed by IBM's Field Engineering Division in White Plains, N.Y., to help customer engineers more quickly locate and correct timing cycle malfunctions in punch card equipment. The solid-state dynamic timer power pack can be attached magnetically to the equipment being serviced.

Patent Office Is Ruffled By First Software Patent

WASHINGTON, D.C. – The Goetz software patent, revealed in last week's *Computerworld*, appears to have shaken the Patent Office, judging from its reaction after the publication.

"It may be invalid. We issue invalid patents every day," First Assistant Commissioner Edwin L. Reynolds told *Computerworld* during an interview.

"We'll just have to wait for the court to decide – and that will probably be sometime next year at the earliest," was Joseph Schimmel's comment. Schimmel is the solicitor for the Patent Office.

A strict "no comment" and "no talking" instruction was enforced on all the examiners involved.

Reynolds, in going over the Goetz patent with *Computerworld* acknowledged that there was a problem involved. "We have not changed our guidelines and we do not think that a program is patentable," he said. The problem, as he saw it, was that a program is simply an algorithm. "It does not have any physical form and it does not change the computer," he commented.

Tape Movement

Schimmel drew attention to a different phase of the patent. He noticed the movement of the tapes and felt that this could easily be interpreted as being a "process" and as such patentable without any problems.

Neither Reynolds nor Schimmel was prepared to comment in any way on the Hamburgen patent (*CW* June 19) which apparently can prevent people from using certain error correction techniques in their programs. Reynolds did, however, say that they were aware of the overall problem and would be delighted to have any comments or suggestions from anyone or any organization on the matter. "Such suggestions should be addressed to the commissioner and will be most welcome," he said.

Still Uncertain

The court to which Reynolds referred is the Court of Customs and Patent Appeals. This court handles cases where an application for a patent has been turned down by the Patent Office. Currently there are a number of cases, which may bring up the issue of whether or not a computer program is patentable as a peripheral issue, which the court may, or may not, decide to handle.

Court Liberal

The Court has a history of being more generous in granting patents than the Patent Office itself, and its findings are accepted by the Patent Office as a basis for their future operations.

However, even when the Court of Customs and Patent Appeals has granted a patent it is still possible for anyone accused of infringing upon it to claim that it is not a valid patent, thus stretching out still further the time in which computer program patents will be in a "doubtful validity" category.

Town Rejects Computer Voting, Prefers Ballots

ARLINGTON, Mass. – Town officials, after two tries at tabulating election returns by computer, have decided to return to hand counting paper ballots.

Officials said the decision was based on the fact that the new system had saved no time, and was disliked by voters.

It is "a lot of baloney" that computers speed results, said the board of selectmen chairman, John J. Bilafer.

"You don't get results immediately" as claimed, he said, adding that by the time all the rejected punched card ballots are hand counted, it takes just as long as hand counting all the ballots.

Frank K. Nicksay, the board of selectmen executive secretary, added that the decision was also based on the fact that if a recount is asked for, a candidate can insist that the recount be made by hand rather than by computer.

Error Caused Delay

In the April 30 presidential primary, an "oversight" resulted in the IBM 360/40 using almost 76 hours in tabulation, as opposed to the approximately 12 to 14 hours estimated for hand counting. The machine on which time was leased for the tabulations was not equipped with a "column binary factor" override to allow cards with punches other than "legitimate" characters to be processed. Because of the complicated election ticket, lack of the override caused 80 to 90 percent of the 9414 ballots cast to be rejected by the computer.

Mary F. Farrington, the town clerk, reported that when the system was used for the first time in an election in March, the results were "fairly good," and that officials seemed to like the system then, although Bilafer said that the counting was slower than had been anticipated.

But, Miss Farrington said, following the April election, officials were "disappointed" because they "had hoped for better results" from the two tries.

Poor Communications

John Ercolini, a controller in the computer room of Philip Hankins, Inc., where the returns were tabulated, reported that the problem was one of "communications." IBM, which wrote the program, apparently didn't know what equipment Hankins had. The firm was surprised when the primary returns could not be run, he said, because IBM had run "extensive" test data through the Hankins machine to test the program, but apparently did not include data that would have called attention to the missing override.

In the March election, the ballot was fairly simple and the override feature was not needed, which is why the error did not turn up then, he said.

Error Cost $5000

Bilafer said that the error cost the town almost $5000, and said that the town feels that IBM should pay the extra cost since it was IBM's error that caused the delay.

As for voter dislike, town officials reported that many persons, particularly the elderly, found computer voting complicated and did not like it.

Mrs. Alexander Vanderburgh, Jr., president of the local League of Women Voters, and Mrs. Donald Pettee, the past president, reported that they personally liked the system.

Mrs. Vanderburgh, who reported that machines "floored" her, said that reading the instructions was very important. But, she said, when people are used to doing something a certain way, it is hard to get them to change, particularly old people.

The ballots used were punch cards with holes partially perforated. The voter indicated his selection by punching out holes with a stylus.

While Nicksay reported that there was some problem of people using instruments other than the stylus provided to punch out the holes, thus mutilating the cards, the computer center reported that less than half a percent of the cards were rejected for mutilations.

Computer Guides Money Machine

STOCKHOLM, Sweden – Instant cash is being dispensed by the Oxie Haerads bank to holders of special credit cards with the help of the bank's computer. Although some other Swedish banks offer similar cashbox service, this is the first in which a computer checks the credit card number and the account's balance before dispensing money.

SEC Turning To Microfiche To Speed Data

WASHINGTON, D.C. – The Securities and Exchange Commission plans to use a microfiche system to increase the speed and cut the cost of supplying corporate information to the public.

For example, a 60-page annual company report, which now costs the SEC about $5.40 a copy to duplicate, would cost about $.50 a copy if reproduced on a 4" x 6" microfiche card.

Microfiche could be "the first real breakthrough in a long-term effort to get the information rapidly and cheaply into the hands of people who can use it," said SEC Commissioner Francis M. Wheat.

Although a reader is needed for viewing the microfiches, it is expected that most brokerage offices would soon have them, making it unnecessary for the average person to buy one.

The changeover might have a beneficial side effect – improved reports. An SEC official pointed out that companies might use more care in preparing the reports if they knew they were going to receive wide readership.

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Firm's New Name: Greyhound Leasing

CHIGAGO – The GC Computer Corp., a computer leasing firm 75% owned by Greyhound Leasing & Financial Corp., is changing its name to Greyhound Computer Corp.

W. Carroll Bumpers, company president, said the name change was designed "to identify more clearly with the strength and financial responsibility provided by our association with Greyhound."

Greyhound Leasing & Financial Corp. is a subsidiary of the Greyhound Corp.

Editorials

The Model 20 Grows Up

The situation of the IBM 360/20 has been an unusual one for some years. Only slightly related to the Model 30 and other models of the original 360 line, it still had some really fine features, particularly the MFCM. Yet, it had a great disadvantage. There was no compatibility and users who needed to upgrade faced major problems.

This year the situation has changed. With the announcement nearly three months ago of the lower cost configurations, the submodels 3 and 4, the Model 20 became available in two performance levels. Now with the new more powerful Model 20s, it is available in three levels. In point of fact, it is now a family in its own right, providing the growth potential which is appropriate for as well used a system as the Model 20.

Computerworld welcomes the appearance of this latest member of the Model 20 family.

A New Freedom

The ability to design your own computer has been embraced in the micro-programming developments of the past decade. In some areas, particularly in process control, it has been a normal action, but not in the scientific or business areas. Now this freedom, at least in part, is available with the IC-6000E system designed to allow its users (largely university people) to create their own machine codes, their own interfaces, and their own techniques, to help discover how much a problem-specialized processor can help.

This is a heady new freedom. Undoubtedly powerful, it will be some time before we know how powerful, but equally undoubtedly it is a major step in the right direction.

Welcome the freedoms of the IC-6000E.

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Viewpoint

Spend 10% More on Computer Lease And Save Money, Executive Says

LOS ANGELES – "I think that people should pay 10% extra and not look for a discount when they lease their equipment," was the key point made by Adrian Bos, president of Computer Sciences Leasing, when *Computerworld* visited him in his office. The leasing firm was only recently set up by Computer Sciences and so far it has not done any actual work. That is to say, no contracts had (at the time) been signed, although some were in process. And yet, this new company was offering, on the surface, a lease which was quite different from any of the others which currently exist. At the moment most leasing companies stress the amount of money saved and the lack of change involved. Bos, an ex-Univac vice president, took a different approach. He stressed the changes that would occur and the amount of money it would cost.

Adrian Bos gives his views to *Computerworld* Editor Alan Taylor during the interview in Bos' office.

Removing Bottlenecks

The rationale was that most computers are currently under-utilized. "The programmers are short, systems analysts are often a bottleneck, and the very time involved to develop the programs is lacking," was Bos' comment. "Normally, the managers cannot get the budgets, and even if they can, they cannot get the people. As a result the computer sits there, under-utilized. Our idea is that we have the programming and systems analysis support of Computer Sciences, along with the financial backing, and therefore give the user the possibility of utilizing his equipment much more economically."

Two-Part Contract

The system would be represented by a two-part contract with the leasing company:

1. For systems work designed to bring the computer operation up to standard.
2. For the purchase and lease-back of his computer.

The latter transaction would release some money, but generally not enough to pay for the programming systems the user would get. These services would be obtained by the leasing company from the Computer Sciences operation and would be managed by it. "They won't be able to slack off, because we will be looking over their shoulders all the time. They will give us a real competitive performance, or we will want to know the reason why," was Bos' comment on this second transaction.

"Real Good Bargain"

"The cost of the services would be fully recovered over the term of the lease but not necessarily that of the computer system which might very well be on a non-full payout basis. In general, the firm will end up paying us 10% more for their equipment and the systems support than they will pay for the equipment alone – and I think they will have a real good bargain."

Letters to the Editor

Election Campaign Reviewed

To the Editor:

Many thanks to *Computerworld* for your efforts toward stimulating interest in the recent ACM elections. As a candidate for office, I appreciated the opportunity to express my views in your pages.

My work requires that I belong to numerous professional organizations related to the computer field. Of these, ACM conducts the most meaningful elections, by far. Generally, either single slates of officers are proposed or only biographical data is provided on opposing candidates. ACM, on the other hand, provides a mechanism for each candidate to state his "platform." *Computerworld* augmented this by opening its pages for the candidates to express their views.

We still have a long way to go in ACM, since apathy still outweighs real interest in the elections. But I think we are going in the right direction, by asking candidates to state their viewpoints and then communicating these to the members.

Again, my thanks for your efforts in stimulating interest in the elections. Keep up the good work.

Richard G. Canning
Vista, Calif.

Well, that shows that those intemperate forums have some good effect, because it was during one of those that ACM was stimulated to start giving that platform to candidates. Ed.

Bull a la Mode

To the Editor:

Three cheers for Sander Rubin – he told it like it was!

H.R.J. Grosch
Gaithersburg, Md.

Dr. Grosch refers to Rubin's letter (CW June 5) which noted that the COC-5 type font, developed by Cie des Machines Bull and originally passed over in favor of MICR with GE's approval, was now being offered by GE as a United States standard. Ed.

More on Access Time

To the Editor:

We noted that your "Measure for Measure" article in the May 29 *Computerworld* concluded that the MAI 2301 disk drive "is faster than competitive drives" and that the average access time (for positioning) is 50 ms.

The disk units with NCR's new Century Series computers have an average positioning time of 44 ms. This is also an average of all possible moves. The minimum positioning time is 20 ms. Maximum is 60 ms., significantly less than the units you compared. The *total* average access time (including 1/2 revolution or latency) is 64 ms. on the low-cost Century 100, or 57.5 ms. on the NCR 655-202 free-standing unit.

NCR disk units utilize plated disks and a 12 head assembly (rather than a single head). The multiple-head design means, of course, that the arm moves a smaller distance to cover all tracks. In any given position, 64 tracks are under head at all times.

P.W. Lappetito
Assistant Vice President
Century Series Products
National Cash Register Co.
Dayton, Ohio

We felt that the introduction of the NCR disks and their timings would confuse the picture unnecessarily, as the MAI drives appeared to be competing only with the already installed IBM 2311s, rather than for new computer orders.

The speed of the NCR disks is certainly outstanding, as we brought out by giving them the top headline when they were announced.

Incidentally, we would like to comment on the way NCR brings out the "total access time" including the latency inevitably involved. This is a better method of measurement of access time than the one currently in use in most of the industry.

Why doesn't someone suggest it be adopted as an industry standard? Ed.

Research Report

How Much Do Tape Flaws Really Cost You?

In the present dispute over the performance standards of computer magnetic tape, one of the weapons being wielded on both sides of the argument is the cost of a computer tape flaw. The basis for many of the calculations being used can be found in the various journals of 1964 and make the following assumptions:

1. That the cost of the flaw is the wastage of the entire computer during the processing, from the period of the time the flaw is found, through the error procedure.

2. That the reverse direction start and stop time of tape units is the same as the ordinary start and stop time.

3. That the programmer, or user, knows what happens when a flaw is encountered.

A typical example of these calculations is shown in the figure. All these points are basic to the formula contained in the figure and the fact is that none of them is valid! As a result, the sums produced by the calculation are open to considerable question.

In fact, the cost of a computer tape flaw in these days of multiprogramming involves only the cost of the entire system *when it is doing nothing else*. That is to say, the cost is actually only the delay to the entire system, rather than the time involved in handling the error. This delay may well be less than the actual time involved, which reduces the cost of the error. Looking at the calculations which purport to show the cost of an error to be some tens of dollars over a year or so and using this to justify premium tape prices should be checked to find this particular error. If they haven't brought it up, just change the phrase "cost" to "maximum cost" and let them argue it out.

While correcting this particular error in the calculation tends to reduce the costs, correcting the other two errors tends to increase them. A flaw on tape causes a wasted piece of tape. The computer catches an error, notes it, and skips a piece of tape. Later, because magnetic tape units still have to be rewound on-line (for no very obvious reason), the same piece of tape has to be moved during the rewind operation. Often a tape which is not paired with another one can hold up the entire computer at this point. If so, you have to add to this the time involved in passing over the bad spots during rewind.

Changing Tape Direction

With regard to the stop and start times, very frequently you find that when you really study the tape instruction, there is an additional time involved just in changing direction. Oh yes, the tape unit can start in 5 milliseconds and stop in 5 milliseconds, but it cannot stop going one direction and start in the other direction in 10 milliseconds. Nowadays things are somewhat better than they were four years ago when the time to reverse direction was in some cases over half a second. But even now, on some units, it is well over 100 milliseconds! That is to say, it can be 10 times the time that is expected. If this is ignored, naturally a completely wrong result will be shown.

In the last area, it is basically assumed that the programmer, or at least someone, knows how many times the item is being checked during a read-error, how many retrys are being made. This is an interesting point because most people think that something like three retrys are being made, but they are not certain. They also think that this particular point is always relevant. A modern operating system takes this type of decision out of the hands of a programmer. He writes in Cobol, the object program refers I/O control to the operating system, and the operating system drivers refer it to some specialized routine. Hardly anyone knows what is in that routine. In one current case, the number of retrys that are made is not, as people think, about three, but is, instead, 100! Moreover, the programmer is not in a position to control this, because it is a hidden parameter within the operating system.

It can be seen, then, that calculations which assume two or three or five retrys would be far out if this were an important part of the calculation. However, it isn't. There isn't just a single task for the tape, as these charts seem to indicate. There are at least three different types of errors which have different costs and only one of them, *which is quite infrequently met*, involves this retry operation. The normal type of error which occurs is where there is actually a permanent flaw on the tape. This is found in the write operation and can be called a write flaw. When this is found, the computer does not move the tape backward and forward; instead, it just leaves the area blank and goes straight ahead, trying to rewrite the block again. In some cases, it leaves the entire area blank. In some cases it actually reverses direction, so that it skips only a specified amount of tape, such as three inches. That is all. It does not (thank goodness) retry to write over a flaw in the way that the calculations appear to suggest.

As well as the write flaw, there is also the case in which an item is written perfectly but a flaw is created in the tape while it is stored and before it is read back. This does involve a rocker motion as the calculation suggests. *But this occurs only when the tape is read and is eliminated the very next time new data is written on the tape.* If, for instance, you compute the cost of an error on tape during a 200 pass life, where the cycle involves a write followed by two reads, the cost of such a read-error involves rocking only, at the most, two in 200 cases. It is only a minute thing, but it makes a lot of difference to the answer.

The third case is really similar to the second case and involves the possibility in which a piece of dust or debris came temporarily to rest on a part of the tape during the write or read operation. This is called a temporary error and is often ignored in counting errors on magnetic tape on the grounds that they do not know how to count them. It is a facile rationalization which is not relevant to this particular article, but which may be an interesting study. Temporary errors which occur during a write operation cause the same simple piece of wasted tape as well as the time to pass over it that a write error costs. However, during a read operation, normally the rocking of the tape dislodges this piece of debris fairly fast and even if the operating system falls here, it is probable that such a temporary error will disappear in the first few movements, so that the cost is under that of a normal reading error.

So far this article has been somewhat negative. We have commented on a number of poor practices in calculation without putting ourselves on the line. Because of space restrictions, it is fairly obvious that we should keep the rest of the article until another week when we will present the *Computerworld* formula for calculating the cost of tape errors, together with some recommendations about some installation parameters which you should establish – and what you should do with your old tape.

Accepted (But Inaccurate?) Way of Figuring Tape Flaw Costs

Cost to Tape Errors Per Week = [No. of Tapes Run Per Day] x [5 Days Per Week] x [Error Cost Per Roll]

Assuming:

- Error Cost Per Roll = [Average Number of Errors Per Roll] x [Computer Prime Time Cost Per Second] x [Time Per Retry] x [Number of Tries Before Skipping]
- Time Per Retry = 2(Stop/Start Time) + 2[Time to Move the Tape Over the Block Length] + [Time to Write Character Block of X Length]
- Stop/Start = Stop Time + Start Time
- Time to Move Tape Over the Block Length = $\frac{\text{Characters/Block}}{[\text{Bits Per Inch}] \times [\text{Tape Speed in Inches Per Second}]}$

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Services

Time Sharing Service Reaches West Coast

LOS ANGELES, Calif. – ITT Data Services has extended its time sharing Reactive Terminal Service to the West.

The service enables users to solve problems by conversing with distantly located third generation computers via standard communications lines and typewriter terminals.

The service was introduced in New York and Boston in April and May, respectively. Service is scheduled to be made available in more than 20 cities throughout the United States within the next 18 months.

Keydata Adds Services

WATERTOWN, Mass. – Keydata, the computer services division of Adams Associates, Inc., is now furnishing scientific and engineering computing services. These are in addition to the time sharing business data processing services which Keydata has been providing since 1965.

"Our immediate aim," said John T. Gilmore, Jr., Keydata president, "is to fill the critical need for economical, reliable, fast, and convenient production processing of customer programs and data. This we are now doing on an overnight turnaround basis, using a Univac 1108. Eventually these services will be expanded to include off-line remote job entry and on-line remote access."

Two Computer Scientists Win $50,000 For Development of Buffered Memory

NEW YORK – Two computer scientists have received a $50,000 cash award for their analysis of a composite memory design approach which increases both the capacity and speed of a computer.

The award went to Donald J. Gibson and Carl J. Conti of IBM's Poughkeepsie, N.Y. laboratory. The buffered memory concept will be used in the IBM 360/85.

The $50,000 award was among awards totaling $370,000, given to three employees by IBM in recognition of their inventions and technical contributions in the computer field and other advanced technologies.

Four employees, including one of the award winners, were appointed IBM Fellows for their contributions to the corporation. Fellows are appointed by the IBM board chairman for a period of five years. IBM Fellows are free to pursue professional objectives of their own choosing and to act as consultants to scientists and engineers in the company.

Award winner Peter P. Sorokin of the Thomas J. Watson Research Center, Yorktown Heights, N.Y., also was named an IBM Fellow for his contributions to laser technology. He holds a number of patents and has received three IBM awards. The award he received this time was for $15,000. He is co-author of a book, "The Laser."

The other IBM Fellows are:

L. Roy Harper of San Jose, Calif., who holds 25 patents. Among his achievements are a number of innovations in the design of high speed circuits and development of high performance electronic components used in IBM computers.

Leon E. Palmer of Lexington, Ky., who has made contributions to the development of electric typewriters and holds 22 patents, including one for the "Selectric" typewriter.

Walter S. Buslik of San Jose, Calif., who holds 11 patents and has contributed to the development of IBM peripheral equipment. His activities have included work on magnetic tape drives, magnetic ink character recognition machines, and, most recently, direct access files.

Following are descriptions of the other 14 cash awards:

Morton M. Astrahan and Bennett Housman, Jr., of Los Gatos, Calif., and Bernard L. Sarahan of Gaithersburg, Md., $45,000 for the invention of an automatic interrupt feature which permits a computer to continue processing information even after a machine request has been made to enter or print out information.

Edward S. Lowry of Poughkeepsie, N.Y., and John Cocke, Frances E. Allen, and James C. Beatty of Menlo Park, Calif., $40,000, for development of algorithms which increase the efficiency of compiled computer programs.

John M. Harker and James D. Carothers, San Jose, Calif., $30,000, for contributing to the development of the removable disk pack.

E. Alan Brown, Albert S. Chou, and Richard H. Darling of San Jose, Calif., $25,000, for inventing a print hammer actuator that provides increased speeds for computer printers and other applications.

Henry J. Gibson of New York City and Jerry A. Enfield of White Plains, N.Y., $20,000, for developing the Compatibility Operating System, which permits computer users to integrate their 1400 series programs into Disk Operating System/360.

Edward A. Kunkel, Jr., Barry D. Macalady, Richard P. McGinnis, and Samuel R. Pulford of Owego, N.Y., $20,000, for developing an airborne antiaircraft defense system.

Antony Proudman and Peter J. Titman of Winchester, England, $20,000, for developing a functional memory concept that simplifies computer operations.

Peter P. Sorokin, a researcher at Thomas J. Watson Research Center, Yorktown Heights, N.Y., $15,000 for developing organic lasers which provide tunability over a large range of the visible spectrum.

Walter E. Mutter of East Fishkill, N.Y., $15,000, for inventing a process for making semiconductor devices which is used in fabricating solid logic technology chips for System/360 computers.

William H. Miller of White Plains, N.Y., and Fred Barson of East Fishkill, N.Y., $15,000, for their invention of an effective method of passivation, or sealing, of semiconductor devices used in IBM computers.

Barbara L. Wood of Los Angeles and Bernard R. Silkowitz of New York City, $20,000, for developing a programming language concept employed in the Report Program Generator.

Murray H. Bolt and Howard H. Nick of Poughkeepsie, N.Y., $15,000, for developing a multiplex coupler which reduces cable delays in high speed computer systems and permits normal system operation in the event one unit is shut down for maintenance.

Gene A. Fisher of Boulder, Colo., $15,000, for development of a direct current servo motor for the IBM 2420 tape drive.

Enrico Clementi of San Jose, Calif., $15,000, for the first theoretical computation of a significant chemical reaction, that of ammonia and hydrochloric acid to form amonium chloride.

Shmuel Winograd of the IBM Research Center, Yorktown Heights, N.Y., $10,000, for a precise mathematical formulation on some aspects of ideal computer design. His formulas permit designers to determine certain optimum arithmetic speeds for a given technology, and contribute significantly to a usable theory of system design.

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Another College Joins Dartmouth Net

HANOVER, N.H. – Norwich University, Northfield, Vt., will join the Regional Computer Consortium based at Dartmouth College here, bringing to 10 the number of colleges and universities participating.

The time sharing network is being operated under a $164,000 National Science Foundation grant (*CW* May 1, 1968). Eighteen secondary schools also are participating.

The goal of the NSF project, called Themis, is to develop ways of improving time sharing operations. The institutions pay their own terminal and transmission costs with time on the GE 635 system paid for by the grant and Dartmouth.

EDUCATION

School Buys School

COLONIE, N.Y. – Computer Environments Corp. has purchased Cybernetics Institute here for an undisclosed number of shares of the common stock of the company.

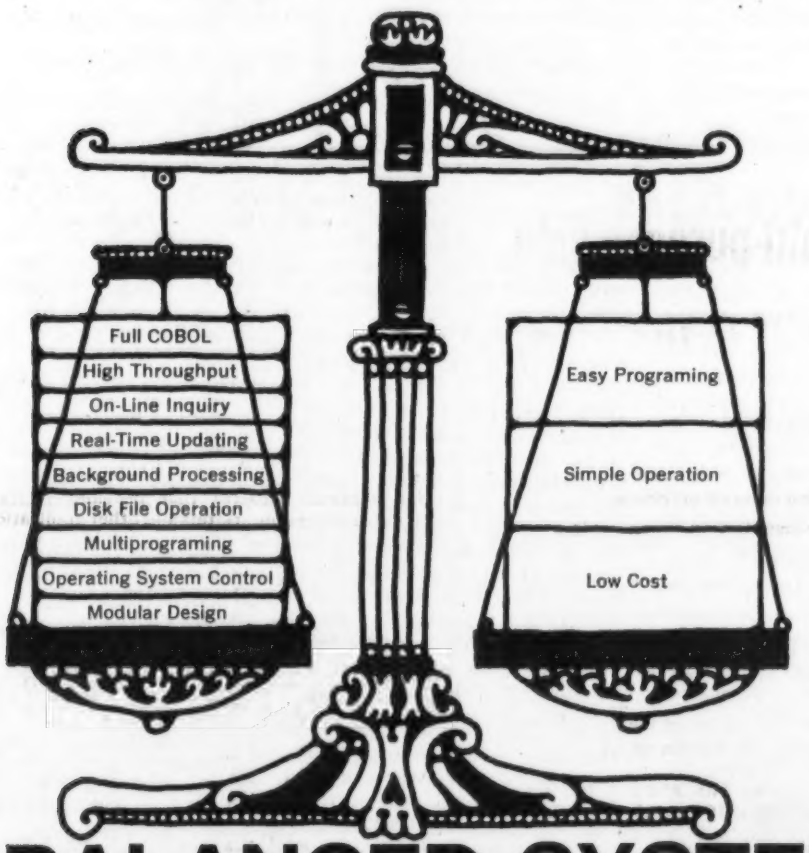
Computer Environments operates schools in New England specializing in computer oriented education and also offers seminar programs on the use of computers and related subjects to top and middle management personnel.

Cybernetics Institute operates a computer training school.

Granite Enters Field

NEW YORK – Granite Equipment Leasing Corp. has entered the computer education field via an agreement in principle to acquire the American Institute of Technology, a computer programmer training school based in Phoenix and Tucson, Ariz.

Granite president Harvey Granat pointed out that his company intends to expand further in the computer education field as a supplement to its computer leasing and data services operations. AIT has an enrollment of 750.



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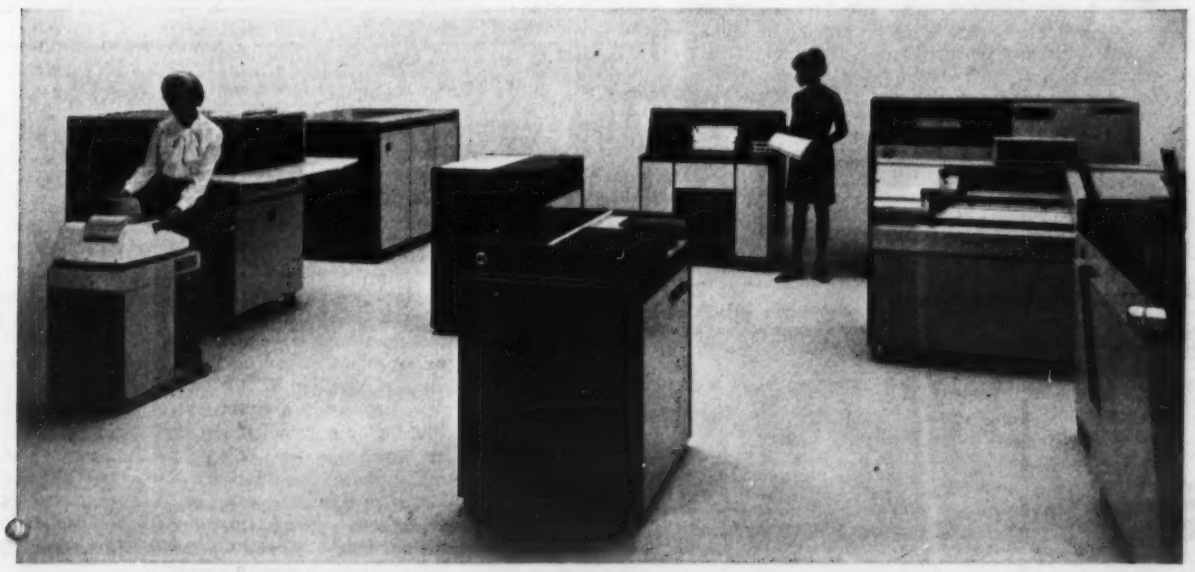

New Literature

Micropublishing Growth Seen

Micropublishing, the use of film as a medium for delivering books, pamphlets, indexes, magazines, and newspapers, is a $15-17 million market which should reach $60-65 million by 1972, according to *Knowledge Report*, a newsletter on innovation and new technology in information handling. The growth, according to the *KR* special report, is almost exclusively in back issues and collections. Micropublication of mass publications is unlikely because projected film is still hard to read and equipment is still expensive and inconvenient to use. Copies are $5. Knowledge Sciences Inc., 342 Madison Ave., New York, N.Y. 10017.

General Electric Communication Products Dept. has published bulletin ECD-16 on the GE DigiNet TDM-210 frequency-shift keyed data set. The publication describes equipment for transmission of asynchronous serial binary data at speeds up to 1800 bits per second over two or four wire dedicated voice lines and for party line polling such as found in digital telemetering and CRT terminal applications. Write to: Section P, General Electric Co., Communication Products Dept., P.O. Box 4197, Lynchburg, Va. 24502.

A condensed description of the Modem 4400 data sets and companion equipment is contained in Folder 3C8, which includes a brief technical summary of three models of data sets, specialized voice adapters for voice/data transmission, and transmission test equipment. Write Milgo Electronic Corp., 7620 N.W. 36th Ave., Miami, Fla. 33147.

The Sigma 7 system is described in a new four-page folder to help students master the techniques of computer usage and to aid in the development of advanced hardware and software systems for processing data from a variety of scientific disciplines. Characteristics of the central processor unit, mainframe options, and major peripheral devices are summarized. Folder 67-17-03A can be obtained from the Advertising Dept., Scientific Data Systems, 1649 17th St., Santa Monica, Calif. 90404.

An eight-page descriptive brochure on General Electric's line of photoelectric tape readers, reelers, and reader/reeler combinations is available from the Printer-Reader Business Section, General Electric Co., 511 North Broad St., Philadelphia, Pa. 19123. Ask for GEA-8492.

"Programming, Programmers, and Performance," a four-page brochure describing the services offered by International Programming Corp. may be obtained by writing the company at 9 East 41st St., New York, N.Y. 10017.

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Sidney S. Sapsowitz	Vice President	Penta Computer Associates, New York, N.Y.	Corporate Systems Manager Metro-Goldwyn Mayer, Inc.

SDS Expands Canadian-Based Operations

LOS ANGELES, Calif. – Scientific DataSystems, Santa Monica, Calif., is expanding its Canadian sales applications support and maintenance staffs.

The company will hire a number of new sales representatives and add more customer engineers during 1968. Canada-based customer engineers began work for SDS early in 1968. Previously, SDS equipment installed in Canada was serviced by technicians headquartered in the United States.

SDS currently has computers installed or on order in seven provinces, including Sigma computers at the Defense Research Board in Quebec and Victoria, CAE Industries, University of Saskatchewan, Computing Devices of Canada, and Century Geophysical Corporation, Calgary.

New Bull-GE Departments

PARIS – Bull-General Electric has announced plans to establish two new departments to meet the demand for the company's data processing equipment and services. The departments will concentrate on direct processing systems and peripheral equipment. Jack B.D. Petersen, a veteran B-GE manager, was appointed manager of the new Direct Processing Systems Department with headquarters in Saint Ouen. Stephen G. Jerritts was named manager of the new Input/Output Devices Department, with headquarters in Belfort.

Expansions

DIP Open Offices

PRINCETON, N.J. – Data & Information Products, Inc. (DIP), an Applied Data Research, Inc. subsidiary, has opened and staffed branch offices in New York, St. Louis, and Milwaukee.

DIP, a marketing/sales company that specializes in representing a number of data processing companies, has executive offices in Chicago and a previsouly established branch office in Detroit.

The New York office is at 450 Seventh Ave. where ADR also maintains its local systems and programming office. Peter Borkowitz, who recently joined the company, manages DIP's New York area operations.

The St. Louis area office is at 7811 Carondelet Ave., Clayton, and is managed by Arnold Nelson.

The Milwaukee area office at 2433 N. Mayfair Rd., Wauwatosa, is managed by V. Beeler.

CUDC Opens Office

MT. KISCO, N.Y. – Computer Usage Development Corp. (CUDC) has opened a new Albany office at 678 Troy-Schenectady Road in Latham, N.Y. It will be headed by Jack Halley.

CSC Gets Design Contract for UCAF Logistics

The Naval Air Engineering Center, Philadelphia, has awarded Milgo Electronic Corp. a manufacturing contract for approximately $1 million. The contract is for the production of radar signal processing equipment. This is the second recent Navy contract to be awarded to Milgo. In March, they received a $423,000 contract to design, manufacture and install electronic equipment at Roosevelt Roads Naval Base in Puerto Rico.

CONTRACTS

New contracts totaling more than $1.7 million were received by Epsco, Inc. Three contracts valued at $1.2 million were received from the Army Missile Command for modifications and field test equipment. A contract amendment for $349,000 was awarded by the Naval Air Systems Command for spare parts for synchro data converters. Kelly Air Force Base awarded a contract for $76,431 for the manufacture of data measurement units, and the Ocean Systems Division of Sanders Associates, Inc. awarded a contract for $77,000 for analog-to-digital conversion adapted to an anti-submarine warfare system.

The Canadian Department of Defense has awarded a contract to Computer Sciences Canada Ltd. to assist in the design of a computer-based logistics system to serve all of Canada's land, sea, and air forces. The new system will replace existing systems developed by the Royal Canadian Air Force, Army and Navy prior to their integration into the United Canadian Armed Forces.

The Indonesian government has ordered construction of satellite communication equipment for a terminal which will be located 80 miles southeast of Djakarta. ITT Defense Communications designed and engineered the communication equipment which will be installed, operated, and maintained by P. T. Indonesian Satellite Corp., an ITT subsidiary, under lease from the Indonesian government, which will own the station. ITT Defense Communications will train Indonesian personnel to operate and maintain the terminal.

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SDS Forms Peripheral Product And Computer Divisions

LOS ANGELES, Calif. – A new division, Peripheral Products, has been formed by Scientific Data Systems. The division, headed by James Y. Payton, will be responsible for the development and manufacture of mass memories, magnetic tape units, card equipment, line printers, and other peripheral devices which are sold with SDS computers.

Another new division, Computer Manufacturing, also has been formed. Under Robert L. Gardner, the division will be responsible for the production and testing of computer systems and subassemblies.

Dan McGurk, SDS senior vice president of operations, said, "Due to the company's recent growth, the responsibilities for production of peripheral products and computer products have been separated, and each has been given divisional status.

Poland to Make Printers

LONDON – International Computers and Tabulators Ltd. (ICT) has licensed the Polish state trading enterprise, Metronex, to manufacture high speed line printers in Poland. Production of Type 66 printers will be centered near Warsaw.

35 Seminars to Cover Wide Range of Topics

WASHINGTON, D.C. – Discussion of control, planning, standardization, and legal problems will highlight the 35 seminars at the DPMA 1968 International Data Processing Conference here June 25-28.

The program this year will be divided into 10 series of three seminars each plus five seminars of general interest. Another five sessions will be repeats of selected earlier seminars for persons unable to attend the earlier sessions.

Some of the most significant seminars will be:

Cobol Standards

A discussion of how good the proposed Cobol standards are and of the current status of the effort to effect standardization will be led by Howard Bromberg, vice president of Information Management Inc., and Stanley M. Naftaly, senior technical advisor, Office of the Special Assistant to the Secretary of the Navy. The session will be Wednesday afternoon (Series 2, Seminar B).

MIS Planning

Aspects of management information system planning, with emphasis on information requirements, expediting planning policy, and system development, will be discussed at a session chaired by William J. Horne, assistant vice president, United Shoe Machinery Corp. The session will be Thursday morning (Series 3, Seminar B).

Data Management

An objective evaluation of the new data management systems under various conditions and with different applications will be discussed at a seminar on disk and data cell file management Thursday afternoon (Series 1, Seminar C). The advantages and the limitations of generalized data management systems will be covered, as well as the availability of various systems and the techniques of evaluating file management systems.

Operations Control

The problems of maintaining control over computer operations and programming also will be discussed Thursday afternoon (Series 6, Seminar C). Areas to be covered include the questions of whether complete control is possible, how it can be accomplished, and how much it will cost.

Charging Methods

Customers must be charged for use of systems and services, but in practice, especially with time shared systems, time control and charging become difficult. There are many ways to distribute overhead charges, and discussion will center on the advantages and disadvantages of various methods at a session Thursday morning (Series 9, Seminar B.)

Legal Developments

A session on legal and legislative developments affecting the data processing community will be held Friday morning at one of the general interest seminars. Current questions which need decisions and how these questions affect what practitioners can and cannot do will be explored.

Conference to Open in Washington

(Continued from Page 1)

presentation of an award representative of the first computers merit badge awarded in the new Boy Scouts of America program. The special award will be presented to a 14-year-old Eagle Scout from Van Nuys, Calif., Steven P. Wedell.

The conference will close at noon Friday with a luncheon address by DPMA International President, Theodore Rich, controller of Lincoln Income Life Insurance Co., Louisville, Ky. His topic is "The Data Processor's Responsibility to Society."

Leonard Jaffe Receives IEEE Award

PHILADELPHIA, Pa. – The Institute of Electrical and Electronics Engineers Award in International Communication was presented to Leonard Jaffe, director of space applications programs in NASA, during a banquet at the IEEE International Conference on Communications here.

Jaffe was cited for "his outstanding foresight, initiative, and competence in developing and executing an experimental program in communications satellites, and in organizing and guiding international participation therein."

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DPMA Conference Agenda

Sunday, June 23

1:00 p.m.— 6:00 p.m.	Registration Open

Monday, June 24

8:00 a.m.— 9:00 p.m.	Registration Open

Tuesday, June 25

8:00 a.m.— 9:00 p.m.	Registration Open
1:00 p.m.	Exhibit Opening Ceremony
1:00 p.m.— 7:00 p.m.	Exhibit Viewing
9:00 a.m.—11:30 a.m.	Tour—Government Employees Insurance Company
9:00 a.m.—11:30 a.m.	Tour—National Aeronautics and Space Administration
9:00 a.m.—10:00 a.m.	Tour—Suburban Trust Company
9:30 a.m.—12:00 p.m.	Tour—National Bureau of Standards (both tours)
10:00 a.m.— 3:00 p.m.	Tour—Social Security Administration
11:00 a.m.—12:00 p.m.	Tour—Suburban Trust Company
1:00 p.m.— 3:30 p.m.	Tour—Government Employees Insurance Company
1:00 p.m.— 3:30 p.m.	Tour—National Aeronautics and Space Administration
1:00 p.m.— 3:00 p.m.	Tour—National Brewing Company
1:00 p.m.— 2:00 p.m.	Tour—Suburban Trust Company
3:00 p.m.— 4:00 p.m.	Tour—Suburban Trust Company

Wednesday, June 26

8:00 a.m.— 5:00 p.m.	Registration Open
8:30 a.m.— 6:00 p.m.	Exhibit Viewing
9:30 a.m.—11:00 a.m.	General Assembly
12:15 p.m.	Conference Luncheon
2:00 p.m.— 4:30 p.m.	Seminars

Thursday, June 27

8:00 a.m.— 5:00 p.m.	Registration Open
8:30 a.m.— 6:00 p.m.	Exhibit Viewing
9:00 a.m.—11:30 a.m.	Seminars
12:00 Noon	Conference Luncheon
2:00 p.m.— 4:30 p.m.	Seminars
7:00 p.m.	Banquet and Entertainment

Friday, June 28

8:00 a.m.—12:00 Noon	Registration Open
8:30 a.m.—12:00 Noon	Exhibit Viewing
9:00 a.m.—11:30 a.m.	Seminars
12:00 Noon	Farewell Luncheon

White House Tour Set for Wives

WASHINGTON, D.C. – Two VIP tours through the White House and tours to significant landmarks and points of interest are included in the three-day program planned for wives of attendees at the DPMA Conference.

The specially arranged White House tours are scheduled for June 26 and 27.

Also on June 26 is a tour to Mount Vernon by way of Alexandria, Va., with lunch at Orlean's House in Rosslyn, Va. On the way back, the tour will stop at Arlington National Cemetery to watch the changing of the guard at the Tomb of the Unknown Soldier and the gravesites of President John F. Kennedy and Sen. Robert F. Kennedy.

On June 27, the group will be taken on tours of the Capitol and the Smithsonian Institute, followed by a special luncheon at the Evan's Farm Inn in McLean, Va. On the return trip, the group will pass Embassy Row. That evening, the ladies will join the men for a banquet.

The special ladies' program will conclude Friday with a fashion show and luncheon at the Shoreham Hotel.

Over 100 Exhibits Expected at DPMA

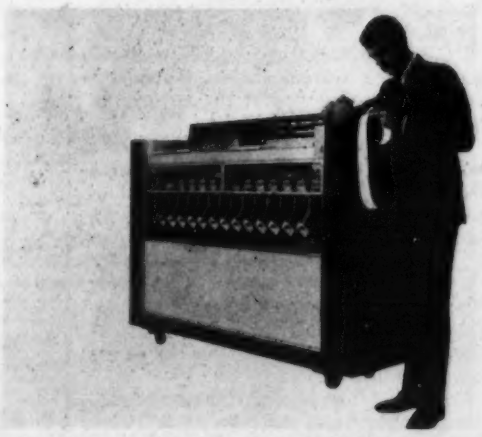
WASHINGTON, D.C. – More than 100 manufacturers of computer and allied data processing equipment and supplies will participate in what is hoped will be the largest industry exhibit of its kind in the Hilton Hotel here June 25-28.

The exhibit, part of the Data Processing Management Association's 17th International Data Processing Conference and Business Exposition, is expected to draw 30,000 visitors as well as the expected 3500 conference registrants.

Among the products to be displayed are the Cummins Scanak 216 optical scanner and a complete line of perforator tapes manufactured by Robins Data Devices, Inc.

Financial, commercial, and industrial operations, and data processing centers will find the Scanak 216 increases computer capabilities by permitting automatic input of many types of data not previously available in time to be of use, according to the manufacturer, the Cummins-Chicago Corp.

The Scanak 216 is a combination of a bar reader, a mark reader, and a perforated figure reader with the additional capability of reading a five-level code that can be printed by any computer line printer. Any program can be patched to print the essential transaction information in this new code at the same time that the same information is being printed visually, the manufacturer states. The unit can read in any combination of these ways from the same document in a single pass, facilitating the creation of turn-around documents and making automatic input feasible in many cases where it was not previously practical.



The Cummins Scanak 216 will be among the products exhibited at the DPMA business exposition.

The Robins display, in addition to a complete line of tapes, is expected to include accessories, ranging from tape winders to splicers, used in data processing, communications, numerical control, phototypesetting, and computer functions.

Peoplework Replaces Paperwork

MEMPHIS, Tenn. – City of Memphis hospitals are using a computer-based system against several of modern medicine's major foes: rising costs, time shortages, and increasing demands for scarce professional skills.

The 900-bed complex recently installed an electronic reporting and analysis network that includes typewriter terminals at nursing stations and a modern laboratory testing system.

Controlled by technicians and physicians, the system analyzes data and prepares reports expected to cut time and costs of some lab work by more than 90%, speed admission of new patients, free nurses and lab technicians from time-consuming paperwork, and maintain accurate, updated records.

"Electronic data processing is the prime salvation of hospitals," said Dr. Glenn M. Clark, chief of staff. "Without it, mountains of paperwork literally would bury hospitals within a decade."

Fast Analysis

One of the major sources of information is the hospital's laboratory. There, an IBM 1080 data acquisition system gathers test results from manual and automatic testing devices and transmits them to the IBM 360/40 for entry in the patient's record.

At the blood testing station, for instance, the carousel blood sampling unit works with an automatic analyzer to test up to 40 samples each hour. A small punched card travels with each sample throughout the test cycle, insuring accurate patient identification. The sipping unit of the blood analyzer splits the plasma specimens into several streams for simultaneous performance of several tests, determining such things as level of blood sugar, enzymes, sodium, and other chemicals in the blood. The 1080 monitors the flow of the tests, reporting the results via punched tape.

"The computer checks for deviations within specified accuracy limits, insuring that the testing equipment and chemicals used are within quality limits," said Dr. Dempsey B. Morrison, clinic lab director.

"Blood testing used to take up to 90 minutes of lab work for each test," Morrison said. "Now, it takes seven to nine minutes. In addition, a typical 12-test series used to cost about $60 per patient. Now, we perform 12 tests on a single sample for $5."

Increased Patient Load

As the demands for hospital services increase, time and resources devoted to admissions procedures and patient record-keeping increase.

"We have designed enough flexibility and capacity into the system not only to meet today's demands for service – which are unprecedented – but also to handle increased demands of the foreseeable future," Clark said.

Terminals at admission stations help speed patient service. Using one of these terminals hospital staff members can quickly and accurately create electronic patient admission records.

These records include such information as patient number, name of doctor, insurance company, medical history, and reason for seeking hospitalization. Reports on laboratory test results, nurses' notes, physician diagnosis and instructions, and progress reports periodically update the patient's computer-stored record.

Eight keyboard units now are located at nursing stations, with plans calling for 75 such units by year's end.

"The new terminal network will save untold hours of professional nursing time – time we can apply directly to improved patient care," Clark said.

"At the same time, the new procedure will guarantee accurate records and permanent, more adequate reports for outpatient or readmission use."

Medical technologist Jody Splann inserts a sample and identifying card into the automatic blood testing device.

Paper Mill Has New Watchdog

BROKAW, Wis. – Nothing complicates a printer's life more than paper stock with too little moisture – unless it's paper stock with too much moisture.

Wausau Paper Mills Co. here, in an effort to eliminate that trade problem, has implemented computer control of a 1500 feet a minute paper making machine to maintain precise moisture level in the finished stock. The IBM 1800 data acquisition and control system also controls basis weight in the stock to assure delivery by weight as specified.

Dr. Richard W. Roberts, computer manager, said the system enables Wausau to deliver a better product to the customer at less cost to the mill.

"By supplying a printer with fine paper which we know is within a tight specified moisture level range, we are enabling him to do a better job for his customers with little or no paper spoilage.

"Similarly, by filling his order for 70-pound stock with paper which is truly 70-pound basis weight, we give the customer what he paid for and at the same time do not penalize ourselves by giving him more than he paid for."

Computer control of the 100 ton per day machine begins at the pulp entry point. "Target weight and moisture objectives are entered into the computer by a machine tender on a manual entry unit at the wet end of the machine," Roberts said. "As the pulp proceeds through the machine, measuring instruments take readings of the actual condition of the product and feed this data to the system. The computer compares these readings with the target objectives and makes whatever adjustments are necessary."

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Computer Plots Search Patterns For Oil Hunters

ANCHORAGE, Alaska – A computer is being used as a "pathfinder" for oil seekers in Alaska's wilderness.

"The transit and plumb line have given way to helicopters, planes, boats, electronic range and direction finders, and the computer," said Frank Lindsey, president of the F.M. Lindsey Co. here.

"These techniques compress what normally would require days into a few hours and speed the development of Alaska's new areas," he said.

The Lindsey Co. is exploring and surveying an area from Point Barrow, the northernmost outpost of civilization in the United States, down the Alaska Peninsula and across the Aleutian chain.

The firm's IBM 1130 computer charts the exact navigation routes Lindsey's aircraft and boats must follow to produce surveys assigned by petroleum, mining, and construction companies.

It is also being used in such projects as positioning a complex offshore drilling platform from which 32 different wells may be drilled in the often ice-choked Cook Inlet, or for "navigating" the laying of 35 miles of pipeline from an offshore installation to one onshore.

Old Methods Unusable

Dense forests, swamps, and the unpredictable tides of Cook Inlet or the Gulf of Alaska make conventional methods of surveying virtually impossible.

Helicopters are often used, for example, to locate drilling sites in remote areas inaccessible by jeep or days away on foot.

The Lindsey Co. also uses helicopters to survey ice-bound water areas. Flying to precise locations plotted by the computer, the helicopter can hover above the ice and lower instruments through it to survey the sea bottom.

In a seismic survey to explore the bottom composition of Cook Inlet, the computer pre-plots an exact course for a boat over specific portions of the sea bed. Seismic instruments measure and probe the bottom to depths of 10,000 feet in the search for potential oil pools as the boat proceeds along its course. Readings from these and other instruments enable geophysicists to determine locations for possible offshore drilling platforms.

Similar pre-plotted courses are provided by the computer for helicopter and aircraft pilots in the survey of land and water areas. As the aircraft flies the course, the pilot regularly compares the pre-plot with instruments in the aircraft, which receive a constant series of signals from electronic navigation equipment installed at known geographic points on the ground.

Time, Money Saved

"Accurate surveys of this kind require plotting thousands of exactly located points," Lindsey said. "Manually, this would take weeks and would cost approximately three dollars per point.

"The computer has not only added greater precision and reduced the time factor substantially, it has also cut the cost per point to about two cents."

A helicopter pilot uses a computer prepared flight chart as he flies over Alaska's Kenai Peninsula in search of oil deposits.

System Analyzes Bids for Agriculture Department

MINNEAPOLIS, Minn. – Using space-age mathematical modeling skills, the U.S. Department of Agriculture's Minneapolis Processed Commodity Office has made some remarkable advances in perfecting automatic bid evaluation techniques.

The office's computer system uses linear programming techniques to select the most favorable combination of bidders, thereby assuring the most commodity or processing service for the least total dollars, according to John Wenn, Jr., office director.

"It used to take our marketing specialists days or even weeks to provide an answer and even then we didn't know whether we had the 'right' answer," Wenn recalls. "The computer does the same job in seconds or minutes," he said.

The Minneapolis office, one of three operated by the USDA's Agricultural Stabilization and Conservation Service, is responsible on a national basis for the purchase and handling of more than 60 processed commodities, including dairy products, processed grain commodities such as flour and corn meal, fresh and processed meat, poultry, fruits, vegetables, and various oils.

Government procurements of processed foods often call for bids from 50 to 100 commercial suppliers for delivery to several hundred destinations, Wenn said.

A recent butter packaging contract cited by Wenn as typical involved seven warehouses, 15 packaging firms, and some 30 basing points. The Univac 1107 provided the "best possible deal" in 20 seconds, he said.

In a recent monthly flour procurement task involving 55 bidders and 110 destinations, Wenn notes that the computer beat the office's best manual effort by $46,000 and, in addition, purchased an additional 100,000 pounds of flour which somehow had been lost during the manual effort.

To fulfill its mission, the Minneapolis office must purchase processed food commodities, issue shipping instructions, negotiate contracts for storage, fulfill contracts entered into for processing or repackaging, maintain a quality and quantity management program, sell, trade, or donate certain commodities, and perform accounting functions.

At times, its annual disbursements are well in excess of a billion dollars.

In one recent year, the office purchased nearly two billion pounds of dairy products.

Its inventory at times includes up to 22,000 carloads of commodities in some 400 storage warehouses.

The computer is being used to solve many general purpose data processing tasks associated with each of these areas of the USDA's business.

Fruit Growers Cooperative Automates Operations

LAKE WALES, Fla. – The Florida Citrus Canners Cooperative, one of the state's largest fruit processors, is keeping pace in a booming and complex industry with the aid of a computer. It tabulates the data that keeps the flow of up to 60,000 boxes of citrus a day moving from growers' trees to processing at the cooperative plant.

In addition, the computer supplies inventory, sales distribution, and production statements to the cooperative while handling numerous accounting functions, including the plant payroll.

The result is valuable information for 1000 citrus growers and the owners of the cooperative – 10 fresh fruit packing groups. The growers, who maintain 40,000 acres of citrus trees, supply the Lake Wales plant with the oranges, grapefruit, tangerines, and limes to market in a fluctuating industry.

James F. Childs, cooperative treasurer, said sale of all products from the plant now average about $35 million annually. Production last year, up 40% from 1966, reached a volume of 10,250,000 boxes of fruit, third largest among Florida citrus processors.

Childs said the cooperative is the only processor which packs the entire line of citrus products, including fruit sections, salads, juices, and concentrates. The plant operates year-round to process all the citrus its members do not sell as fresh fruit.

The business is complex because citrus appears in various grades and varieties during the harvesting season and market prices change often. To keep track of the fruit and to insure growers the best prices, the cooperative lumps citrus into periodic pools for processing and marketing.

"The idea is to break the sales down from the time the fruit comes in," Childs said. "We often take 60,000 boxes of fruit a day, and the only way to keep track of it is with the computer."

Each grower is credited with the pounds of solids and gallons of juice he contributes to each pool, and the cooperative markets the concentrate or juice at the highest price it can get through brokers.

The cooperative can keep track of its products all the way through the distribution process by codes stamped on cans, which indicate when the citrus is processed and packaged.

The computer's role in marketing the citrus begins with an order from a food broker. The order is punched on a card and fed into the IBM 360/20 and copies are prepared for the broker, the customer, and the cooperative's file.

"When we have a shipment ready, the card is used to write the requisition and to record the canning code," Childs said. "We use these cards to run our inventory, sales distribution, and position statements. We actually run a production statement every day on the computer.

"With this system we always know our marketing position and there is no way that we can be oversold."

CRTs Help Update Insurance Policies

BOSTON, Mass. – Desk top information display systems provide instantaneous visible access to policyholder information at the New England Mutual Life Insurance Co.

The units, Raytheon DIDS-400 digital information display systems, are tied to a $2.5 million Univac 1108 computer.

The system allows employees having units on their desks to query the computer for policy information and receive an immediate answer. It provides direct interface between operator and computer and eliminates card punching, batch totaling, and other intermediate steps. Inquiries concerning an account, transaction, schedule, or other business procedure can be processed directly from the keyboard of the display terminal before being entered into the computer. Information is returned quickly for display on a 6" x 9" screen where it can be analyzed, updated, and returned to the computer for further processing.

All composing and editing is executed off-line before transmission. This means the system is connected to the computer only when an actual transfer of data is desired.

By means of the almost noiseless electronic keyboard an operator can write 64 different alphanumeric characters on the charcoal grey screen, where they appear in a bright, contrasting green. The monoscope technique of generating characters gives high legibility even to such symbols as "&" and "@". As many as 1040 characters can be displayed at one time on the DIDS-400 screen.

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Lawrence Radiation Lab Installs Sixth CDC 6600

Orders and Installations

The Lawrence Radiation Laboratory has installed a Control Data 6600, the sixth, at its Livermore, Calif., facility. Four 6600 systems are now in use at Livermore and two at Lawrence's Berkeley Laboratory. Under contract to the U.S. Atomic Energy Commission, Lawrence Radiation Laboratory, operated by the University of California, provides research and development in nuclear power.

Rubery Owen, a diversified engineering group located in Darlston, England, has ordered a Honeywell 2200 computer for a proposed production control and management information system. Delivery is scheduled for late this year. The system will be used to control materials, production, and forecasting, and to develop a new production planning and materials control system.

Sylvania Electronic Systems, Needham Heights, Mass., has ordered an SDS Sigma 7 computer for use in an advanced real-time digital simulation and computing system which Sylvania is developing for the U.S. Naval Training Device Center, Orlando, Fla. The Sigma 7 will be used with a variety of analog and digital equipment to provide real-time simulation of advanced vehicle, weapon, command and control, and other military training systems.

General Computing Corp., Oklahoma City, Okla., a new corporation formed by Behnam-Blair & Affiliates, Inc., has installed a GE-255 time sharing system under long term lease. The system is expected to provide computing power to the parent company's architects, engineers, and consultants throughout the country, while simultaneously offering the service commercially to petroleum, financial, manufacturing, engineering, contracting, educational, and governmental organizations.

The first of five mobile computer systems has been delivered to the U.S. Army at Ft. Hood, Texas. The IBM 360/40 system is installed in four 35-foot trailer-vans and seven two and one-half-ton Army trucks. The trucks are remote stations and carry equipment used to communicate with the vans. The Combat Service Support System pools logistics and personnel records in a central computer to keep a running account of the supply and demand of Army field-support services. It provides field commanders with information ranging from the number of troops and vehicles ready for duty to the amount and type of supplies in stock and in logistics channels.

Scheduled for delivery to Hanna Paint Manufacturing Co., Columbus, Ohio, an NCR Century 100 system will be installed to control inventories of both raw materials and finished products. The inventory application will involve colors and types of paints as well as container sizes which are stocked in warehouses in various parts of the country. Inputs to the system will be via punched paper tape, prepared as a byproduct of invoicing on NCR 35 accounting machines. The new system will also handle payroll, billing, and eventually the calculation of ingredients necessary for various sized paint batches.

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DATA STATIONS
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DATA BANK
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July 1, Washington, D.C. – "Project Control Systems for Data Processing." Contact: Brandon Systems Institute, 1611 North Ken St., Arlington, Va. 22209. (Also July 1 at Los Angeles, Calif.)

July 8-12, Princeton, N.J. – "Analog Simulation and Computation." Contact: Director, Education and Training, Dept. 10-17, Electronic Associates, Inc., P.O. Box 582, Princeton, N.J. (Also July 8-12 at Los Angeles, Calif.)

July 8-12, Los Angeles, Calif. – "Computer Evaluation and Selection." Contact: Registrar, Computer Learning Corp., 6201 Leesburg Pike, Falls Church, Va.

July 15-19, Los Angeles, Calif. – "Time Sharing." Contact: Registrar, Computer Learning Corp., 6201 Leesburg Pike, Falls Church, Va. 22044.

Preliminary GIS Timings Released

WHITE PLAINS, N.Y. – Preliminary performance figures for the new IBM Generalized Information System (GIS), announced for 1969 delivery, have been issued by IBM. They show that the operation during searching a file is currently central-processor, rather than tape-file, limited.

Timings for two cases have been released, both involving a complete search of 220 feet of magnetic tape (about 10% of a standard 2400 foot reel).

The searches took, respectively, two and a half, and five minutes – even though the tape transport, a fast one, could have processed the data in under half a minute. The search times did not include the time actually necessary to compile the inquiry program (which took around two minutes) or the time involved in printing out the result of the search. The IBM Generalized Information System is designed to reduce or eliminate programming problems when a one-time report is required by providing a generalized reporting program based on a central file.

In the performance tests, a series of 11 queries was processed against a file containing 9129 records of 270 bytes each, blocked in five-record groups. Since the file was not in sequence, a complete search was required for every query. The timings released were for the first and eleventh queries.

As conditional statements were added to the first run, the execute time appeared to increase in a linear manner. The test was run on a 360/50 system with 524,288 bytes of core storage. The GIS files were on a 2311 disk drive and the master file on a 2401 Model 6 tape unit. The file used was made up of single segment records.

Run	Tot # Stmts	Procedural Statements	Compile Min	Compile Sec	Execute Min	Execute Sec	Remarks
1	5	QUERY LOCLIB2 LOCATE RECORD IF NUMBER EQ '0003122' LIST RECORD END PROCEDURE	2	00	2	30	Complete File Search Made

Compilation and execution time figures for two GIS programs operated on a Model 360/50 with 512K bytes, and the GIS system files on a 2311 disk (75msec. average access) and the master file to be queried on a 2400 Model 6 drive (1600 bpi, 180,000 bytes per second.)

The master file, which had to be searched completely, consisted of 9129 270-byte records, blocked in five-record groups.

Run	Tot # Stmts	Procedural Statements	Compile Min	Compile Sec	Execute Min	Execute Sec
11	17	QUERY LOCLIB2 LOCATE RECORD IF NUMBER GT 'bbbbbbb' AND CUSTNAME SN 'E' AND CITY NE 'XYZ' AND BLANK6 GE 'bbbb' AND RECDMK BT 'A', 'Z' AND RECID GE 'bbb' AND ENTPRISE GE 'bbbbb' AND DPMD GE 'bb' AND DPMR GE 'b' AND DPABO GE 'bbbb' AND NUMBER EQ '0003122' LIST RECORD EXHAUST RECORD LIST '11 SELECTION STATEMENTS' END PROCEDURE	2	30	5	00

Granite Leasing Gets Big Order From McDonnell

NEW YORK – Granite Computer Leasing Corp. has signed leasing agreements with McDonnell Douglas Corp. for $3 million worth of equipment, including 360/65 and 360/40 systems. The equipment will be installed at McDonnell Automation Co., St. Louis.

The leasing company also has agreed in principle to acquire Omni Computer Systems, Inc., a New York software programming and consulting firm, it was announced by Harvey Granat, president of the parent Granite Equipment Leasing Corp.

Other IBM systems leased in the company's first quarter include contracts signed with Hooker Chemical Corp, Lehigh Portland Cement Co., Long Island Lighting Co., Norton Co., and Paramount Pictures.

Granite also announced plans for the expansion of its marketing activities through the opening of leasing offices in Chicago, Pittsburgh, Dallas, and Atlanta.

Granite Equipment Leasing Corp. and its subsidiaries lease third generation computers and other data processing equipment, executive aircraft, business, textile and packaging machines, automobiles, and trucks. The company also furnishes data processing services. Granite maintains offices in Atlanta, Boston, Baltimore, Chicago, Cleveland, Philadelphia, Los Angeles, and San Francisco.

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360 DOS Date Routine

Program gives user Alpha, Short, and Julian dates. Uses either system date or user specified date. Ideal for all DOS languages (COBOL, RPG, PL/I, ALC and FORTRAN).
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Simulator program called BTAM Simulator allows user to De-Bug System/360 Teleprocessing applications without actual terminal hardware and to by-pass communications with existing terminals – while checking out new applications. Developed by Programming Sciences Corporation/Int'l. Paper Company, Graphics Division, 90 Park Avenue, New York, N.Y. 10016.
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EDP Firms Gain in Fortune's 500

CHICAGO – Some 17 computer-related companies have been listed by Fortune magazine in its latest directory of this nation's 500 largest manufacturing firms. The EDP companies (shown in the table) reported 1967 sales of $24,982,427,000 or about 7% of the $359 billion in sales made by the 500 companies, according to an analysis by *Computerworld.*

The average increase in sales since 1966 for the group equalled 25%, very close to the 25.8% increase which Fortune reports for the "Office Machinery" industry which, it says, includes computers. According to Fortune, "with a few exceptions – notably the whopping increase for the office machinery group – the sales gains were more modest than usual." Ranking first this year, with aircraft and parts second with a 21.4% increase, the office machinery group was 10th last year with an 11.5% increase in sales.

The office machinery industry fared less well in comparison to other groups using yardsticks. It ranked third in terms of percentage increase in profits, with a rise of 13.2%, and ranked fifth in terms of return on invested capital, with a 14.2% increase. The office machinery industry as a whole did very poorly in terms of sales per employee. It ranked 21st with median sales per employee of $16,475, up from $13,825 in 1966. National Cash Register's figure of $11,374 sales per employee gave it the fourth lowest rank of the companies described in Fortune's 500.

Sanders Associates, listed this year by Fortune for the first time, ranked 486th, but showed the 10th largest percentage gain in sales over 1966 of the 500 companies. In the past year Sanders' sales have jumped 112% to $139,200,000.

Raytheon posted the second largest gain, increasing its sales 56% to $1,106,049,000. Control Data was third with a 46% gain to $245,171,000. Other big gainers include Xerox, up 33% to $701,448,000; Ampex, up 27% to $214,746,000; and IBM, up 26% to $5,345,291,000.

Xerox led the group with a five year gain in sales of 571%. Control Data was second, increasing 497%. Sanders Associates placed third with a 233% rise, followed by IBM which was up 178%.

Several companies have, in the course of increasing their sales, substantially improved their rank in Fortune's 500 since last year – and since five years ago. Control Data jumped ahead 77 places, from 394th according to 1966 sales to 317th according to 1967 sales. Ampex improved its position by 52 places, from 392nd to 340th. Raytheon had the third largest jump – 42 places, from 113th to 71st.

With the exception of Control Data, the major manufacturers of computer systems showed relatively small gains in their ranking during the past year. Honeywell moved up 10 places; Sperry Rand, 6; RCA, 5; IBM and NCR, 2; Burroughs, 1; and General Electric, unchanged.

IBM's last change in rank came when it moved from 18th in 1963 to 9th in 1964.

Minnesota Mining and Manufacturing was the only stock in the group to lose ground in terms of its rank. It fell from 60th to 65th, while improving its sales by 7%.

Substantial changes in rank over the five year period from 1962-1967 were shown by Xerox, which leaped 297 places, from 423rd to 126th, Control Data, which jumped at least 183 places, and Ampex, which gained 158 places, from 498th to 340th. Sizable gains were also made by Hewlett-Packard, up 89 places; Collins Radio, 49; Amphenol (recently merged with Bunker-Ramo; 46; and Addressograph-Multigraph, 44.

Burroughs showed the largest loss in its ranking over the five year period, dropping 32 places from 124th to 156th. Sperry Rand fell back 9 places, from 37th to 46th. General Electric remained even over the period, holding its rank of 4th. Honeywell gained only three places while NCR and 3M gained 4 places.

Changes in Rank and Sales of EDP Firms

	1967 RANK	'67 Sales ($000)	1 Year % Chg.	1966 RANK	1962 RANK	5 Year Change
General Electric	(4)	$7,741,233	+ 8%	(4)	(4)	+ 62
IBM	(7)	$5,345,291	+ 26	(9)	(18)	+178
RCA	(15)	$3,014,074	+ 18	(20)	(25)	+ 73
Sperry Rand	(46)	$1,487,120	+ 16	(52)	(37)	+ 26
3M	(65)	$1,231,066	+ 7	(60)	(69)	+ 79
Raytheon	(71)	$1,106,049	+ 56	(113)	(85)	+ 90
Honeywell	(77)	$1,044,927	+ 16	(87)	(80)	+ 75
NCR	(89)	$ 955,455	+ 10	(91)	(93)	+ 69
Xerox	(126)	$ 701,448	+ 33	(145)	(423)	+571
Burroughs	(156)	$ 550,613	+ 12	(157)	(124)	+ 30
Collins Radio	(196)	$ 438,962	+ 13	(202)	(245)	+111
Addressograph-Multigraph	(233)	$ 359,967	+ 10	(237)	(277)	+107
Control Data	(317)	$ 245,171	+ 46	(394)	(N-L)	+497
Hewlett-Packard	(319)	$ 243,361	+ 20	(341)	(408)	+123
Ampex	(340)	$ 214,746	+ 27	(392)	(498)	+155
Amphenol (Bunker-Ramo)	(418)	$ 163,744	+ 7	(427)	(464)	+ 76
Sanders Assoc.	(486)	$ 139,200	+112	(N-L)	(N-L)	+233

Big Board Has Record Volume After 'Holiday'

NEW YORK – Trading volume on the major exchanges and in the over-the-counter market surged to record levels on Thursday, June 13. Some 21,350,000 shares changed hands on the New York Stock Exchange, surpassing the previous record of 20,410,000 shares traded April 10.

Ironically, trading had been suspended on the previous day, June 12, as it will be on June 19 and 26, and July 5, in order to give brokerage house back offices additional time to cope with soaring volume. Big Board volume has averaged 14 million shares a day since April 1, up 40% from the first quarter. In the same period, the American exchange daily volume is estimated at about 20 million shares. OTC daily volume is estimated at about 20 million shares, up 150% from the beginning of 1967.

This is the third time in 10 months that such action was felt necessary. Previously, the exchanges closed 90 minutes early for nine days last August and six weeks last winter.

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New Registrations

Listed below are brief descriptions of proposed security offerings, from firms in the data processing field, that are currently in registration with the Securities and Exchange Commission. The preliminary prospectus for any issue may be obtained from the underwriter.

CYBERMATICS, INC. – 2460 Lamoine Ave., Fort Lee, N.J., a company which furnishes services to users of data processing equipment and which leases computers, filed a statement to register some 260,000 common shares. Proceeds from the offering (with the price to be set by amendment, maximum $5) will be used for expansion, working capital, and other corporate purposes. The underwriter is Allesandrini & Co., 11 Broadway, New York.

ENNIS BUSINESS FORMS, INC. – 214 West Knox St., Ennis, Texas, a manufacturer of business forms and related products, filed a statement to register some 127,892 outstanding common. Proceeds from the offering (with the price to be set by amendment, maximum $35) will go to selling stockholders. The underwriter is Eppler, Guerin & Turner, Inc., 3900 First National Bank Bldg., Dallas.

LEVIN-TOWNSEND COMPUTER CORP. – 445 Park Ave., New York, a company which leases electronic data processing equipment, filed to register some $20 million of s.f. debentures due 1978 and 140,000 common purchase warrants, to be offered in units of $1000 of debentures and warrants for the purchase of seven shares. Proceeds from the offering (with the price to be set by amendment, maximum $1020 per unit) will be used for equipment acquisition, debt repayment, construction, and working capital. The underwriter is Kuhn, Loeb & Co., 40 Wall St., New York.

PLANNING RESEARCH CORP. – 1100 Glendon Ave., Los Angeles, a company engaged in computer systems analysis and software design, filed a statement to register some 33,000 common. Proceeds from the offering (with the price to be set by amendment, maximum $40.25) will go to selling stockholders. No underwriter.

COMPUTERWORLD

financial

Computer Stocks Trading Index

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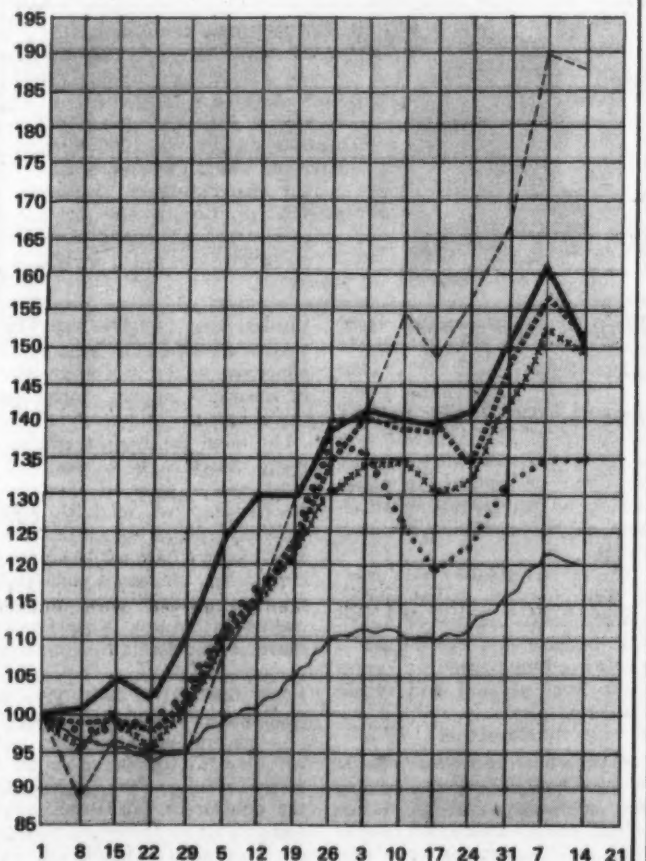
Peripherals & Subsystems
Supplies & Accessories
Software & EDP Services
Leasing Companies
CW Composite Index



LMC Data Gains 46% in a Week

(Continued from Page 1)

Alphanumeric continued its wide fluctuations, losing 14% to 69 after gaining 20% in the previous week. Optical Scanning Corp. was off 12% to 121; Bolt, Beranek & Newman fell 10% to 20-1/2; Tally and Bunker-Ramo were each off 9%. Milgo Electronics led the gainers in the Peripherals and Subsystems sector, increasing 15% to 49-5/8, repeating its previous week's gain. Both Fabri-Tek and Potter Instrument rose 12%.

Data Documents led the Supplies and Accessories sector with a 10% gain to 39-1/2. The next largest gain was made by Reynolds & Reynolds which was up 7% to 45. Barry Wright led the losers in the sector with a 7% loss to 41-1/4.

Four stocks in the Software and EDP Services sector gained 10% or more during the week. Computer Environments rose 17%; Applied Data Research was up 13%; Computer Network rose 11%; and Scan-Data recovered the previous week's 10 point loss and gained 10%. Losses of 9% were suffered by University Computing and Computer Usage. Aries fell 8%.

The Leasing sector produced both the biggest gain and the biggest loss in the table. LMC Data rose 46% to 12-3/4. The stock had remained even for the previous two weeks and before the move stood 17% below its March 1 base price. Dearborn Computer fell 25% to 35 after gaining 38% in the previous week. Substantial losses were also suffered by National Equipment Rental, down 10%, and Computer Exchange, down 8%. Gains of 10% were made by DPA, Inc. and System Capital Corp.

COMPUTER STOCKS: TRADING SUMMARY

AS OF JUNE 14, 1968

EXCHANGE	BASE PRICE 3-1-68	1968 RANGE	CLOSING PRICE	COMPUTER SYSTEMS	WEEK NET CHANGE	WEEK % CHANGE	% CHANGE FROM BASE
NYSE	163 3/8	230–157	213 1/4	• Burroughs	– 4 7/8	– 2.24	+ 30.53
NYSE	67 3/4	101– 66	70 5/8	Collins Radio	+ 4 5/8	+ 7.01	+ 4.34
NYSE	101 1/2	174– 95	105 3/8	• Control Data	– 3 1/8	– 3.01	+ 62.93
AMSE	102	165– 95	138 1/4	• Digital Equipment	– 9 3/4	– 6.59	+ 35.54
NYSE	87 1/4	100– 84	88 7/8	General Electric	—	—	+ 1.86
NYSE	89	91– 69	89 3/8	Honeywell	+ 3/8	+ 0.66	+ 40.38
NYSE	92 1/8	138– 89	133 1/2	• Honeywell	– 6 1/2	– 3.66	+ 43.36
NYSE	289 1/2	375–289	305 3/4	• IBM	– 14 1/8	– 3.65	+ 23.31
NYSE	103 7/8	155– 89	145 3/8	• Mat. Cash Register	– 7 7/8	– 5.13	+ 40.01
NYSE	46 7/8	88– 46	47 3/4	RCA	– 2 1/8	– 4.74	+ 1.87
NYSE	78 1/4	107– 73	89 1/2	Raytheon	– 6 1/2	– 6.13	+ 27.16
OTC	22 1/2	98– 20	84	• Scientific Controls Corp.	– 12 1/2	– 16.60	+140.00
NYSE	119 1/8	173–109	185 1/4	• Scientific Data	– 8 5/8	– 5.26	+ 21.43
NYSE	46	63– 42	56	• Sperry Rand	– 4 1/2	– 7.56	+ 22.22
OTC	22 1/2	39– 20	39	• Systems Engineering Labs.	– 1/2	– 1.27	+ 73.33

EXCHANGE	BASE PRICE 3-1-68	1968 RANGE	CLOSING PRICE	PERIPHERALS & SUBSYSTEMS	WEEK NET CHANGE	WEEK % CHANGE	% CHANGE FROM BASE
NYSE	89 3/8	91– 52	63 3/4	Addressograph-Multigraph	– 7 1/4	– 7.87	+ 42.47
OTC	21	86– 48	69	Alphanumeric	– 11	– 13.76	+228.57
NYSE	35	37– 20	32 3/4	Ampex	– 1 7/8	– 5.42	+ 12.93
OTC	17 1/4	27– 16	20 1/2	Bolt Beranek & Newman, Inc.	– 2 1/4	– 9.89	+ 18.84
NYSE	13 1/2	25– 12	19	Bunker-Ramo	– 1 7/8	– 8.96	+ 40.74
AMSE	32 1/8	50– 27	48 5/8	• Calcomp	– 2	– 3.95	+ 51.36
OTC	12	17– 10	17 3/4	Computer Equipment	– 1/8	– 0.70	+ 47.92
OTC	15 1/4	22– 13	20	• Data Products	– 1 3/8	– 6.44	+ 31.15
OTC	19 1/4	27– 16	24	• Digitronics	– 1/2	– 2.04	+ 24.67
OTC	39	57– 32	44	• Electronic Memories	– 4 1/2	– 9.26	+ 12.82
OTC	19	35– 8	20 1/2	• Fabri-Tek	+ 2 1/8	+ 11.60	+105.00
OTC	34	71– 25	62	Gerber Scientific	– 6	– 8.82	+ 82.35
OTC	12 1/2	24– 10	22	Information Displays	– 1 1/2	– 6.38	+ 76.00
AMSE	16 7/8	52– 14	49 5/8	Milgo Electronics	+ 6 1/2	+ 15.07	+194.07
AMSE	115 1/8	217–106	201 1/2	• Mohawk Data Sciences	– 13 1/2	– 6.28	+ 75.03
OTC	74	138– 71	121	• Optical Scanning Corp.	– 17	– 12.32	+ 63.51
OTC	72	125– 64	112	Photon	– 7	– 5.88	+ 55.56
AMSE	25 5/8	38– 20	35	• Potter Instrument	+ 3 7/8	+ 12.46	+ 36.59
OTC	40 1/4	93– 38	85	• Recognition Equipment Corp.	– 2	– 2.30	+111.18
AMSE	16	29– 14	23 1/8	Rixon Electronics	+ 1/8	+ 0.54	+ 44.53
NYSE	46 1/8	66– 42	59	Sanders	+ 3 7/8	+ 7.03	+ 27.91
OTC	40 1/2	51– 35	43 1/2	• Tally Corp.	– 4 1/2	– 9.36	+ 7.41
NYSE	242 1/4	321–229	321 1/4	Xerox	+ 2 5/8	+ 0.82	+ 32.51

EXCHANGE	BASE PRICE 3-1-68	1968 RANGE	CLOSING PRICE	SUPPLIES & ACCESSORIES	WEEK NET CHANGE	WEEK % CHANGE	% CHANGE FROM BASE
OTC	48 1/2	64– 41	57	• Acme Visible	– 2	– 3.39	+ 17.52
NYSE	41	52– 19	27 5/8	Adams-Millis	– 1 5/8	– 5.56	+ 34.76
OTC	13 5/8	17– 13	17 1/4	• Baltimore Business Forms	+ 7/8	+ 5.34	+ 26.60
AMSE	27	44– 21	40 1/4	• Barry Wright	– 3	– 6.94	+ 48.07
OTC	31 1/4	**	39 1/2	Data Documents	+ 3 1/2	+ 9.72	+ 26.40
OTC	27 1/4	39– 26	39	• Ennis Business Forms	+ 1 3/4	+ 4.82	+ 39.45
NYSE	84 1/8	119– 81	116 1/2	• 3M Company	+ 3/4	+ 0.65	+ 38.46
OTC	58	83– 49	78	• Moore Corp.	– 4	– 4.88	+ 34.21
OTC	27 1/8	33– 25	30	• Moore Business Forms	+ 1/4	+ 0.84	+ 10.60
NYSE	67 1/4	71– 47	69 5/8	Realtron Corp.	– 1/8	– 0.19	+ 21.09
OTC	31 1/4	46– 30	45	Reynolds & Reynolds	+ 3	+ 7.14	+ 44.00
OTC	34 1/2	35– 25	28	• Standard Register	– 1	– 3.46	– 18.84
NYSE	37 3/4	44– 30	30	• Uarco	– 1 5/8	– 5.14	– 20.53
AMSE	14 1/4	22– 13	18 3/8	Wabash Magnetics	– 3/8	– 2.00	+ 28.95
OTC	25 3/4	36– 24	32 1/2	• Wallace Business Forms	– 1/4	– 0.76	+ 26.21

EXCHANGE	BASE PRICE 3-1-68	1968 RANGE	CLOSING PRICE	SOFTWARE & EDP SERVICES	WEEK NET CHANGE	WEEK % CHANGE	% CHANGE FROM BASE
OTC	7 1/2	23– 7	**	• Advanced Computer Techniques	**	**	**
OTC	17	33– 14	30	• Applied Data Research	+ 3 1/2	+ 13.21	+ 76.47
OTC	15 1/2	34– 19	21 1/2	Aries	– 2	– 8.51	+ 38.71
AMSE	47	66– 42	56 1/4	Automatic Data Processing	– 3 7/8	– 6.48	+ 19.68
OTC	9	37– 8	31	• Brandon Applied Systems	+ 1 1/2	+ 5.08	+244.44
AMSE	22 7/8	43– 21	26 1/8	Computer Applications	– 1 3/8	– 5.00	+ 14.21
OTC	7 3/4	12– 7	12 1/4	Computer Environments	+ 1 3/4	+ 16.67	+ 58.06
OTC	30	60– 24	59	Computer Network	+ 6	+ 11.32	+ 96.67
AMSE	40	64– 32	59 1/4	• Computer Sciences	+ 2 3/4	– 4.44	+ 48.12
OTC	39	62– 36	41	• Computer Usage	– 4	– 8.89	+ 5.13
AMSE	36 1/2	61– 36	59 3/4	• Computing and Software	– 4 3/8	– 7.29	+ 63.70
OTC	12 1/2	25– 9	19 1/4	• Digitek	—	—	+ 46.60
AMSE	36 3/8	53– 36	36 3/4	Electronic Computer Prog. Inst.	– 3 5/8	– 8.99	+ 0.68
OTC	35	68– 32	60	• Informatics	—	—	+ 94.36
OTC	21	35– 17	20 1/2	Matrix Corp.	+ 1/2	+ 2.50	– 2.38
OTC	11 1/2	25– 8	28 1/2	• National Computer Analysts	+ 1 1/2	+ 5.56	+147.82
AMSE	31	45– 28	42 3/8	Planning Research	– 3/4	– 1.74	+ 36.69
OTC	**	155– 63	119	Scan-Data	+ 10	+ 10.00	**
OTC	9	15– 8	12 1/8	Software Systems	+ 1	+ 8.99	+ 34.72
OTC	20 1/2	22– 13	13	TBS Computing Centers, Inc.	– 3/4	– 5.45	– 36.59
OTC	63	150– 57	143	• University Computing	– 15	– 9.49	+126.98

EXCHANGE	BASE PRICE 3-1-68	1968 RANGE	CLOSING PRICE	LEASING COMPANIES	WEEK NET CHANGE	WEEK % CHANGE	% CHANGE FROM BASE
OTC	19	63– 19	**	Boston Computer	**	**	**
OTC	19 1/4	28– 16	27 1/2	• Chandler Leasing	– 1/4	– 0.91	+ 42.86
OTC	11 1/2	11– 6	6	• Computer Exchange	– 1/2	– 7.69	– 47.83
AMSE	26 1/8	36– 21	33 3/8	• Computer Leasing	+ 5/8	+ 1.91	+ 32.50
OTC	12 1/8	19– 11	16 3/4	Cyber-Trends	– 1/4	– 1.57	+ 38.07
AMSE	106 5/8	184– 84	141 3/8	Data Proc. Financial & General	+ 1/2	+ 0.35	+ 32.90
OTC	12 1/2	17– 10	11 1/8	Datronic Rental	+ 3/4	+ 7.23	– 11.00
OTC	20	47– 18	35	Dearborn Computer	–42	– 25.94	+ 75.00
OTC	13 1/4	19– 12	19 1/2	• DPA, Inc.	+ 1 3/4	+ 9.85	+ 47.16
AMSE	28 3/4	43– 27	38 3/8	• GC Computer Corp.	– 2	– 4.95	+ 33.48
AMSE	12 1/4	40– 30	34	Greater Equipment Leasing	– 4 3/4	– 8.91	+ 91.76
AMSE	49	84– 46	80 3/4	• Leasco	– 3 3/4	– 4.19	+ 77.04
OTC	8	14– 6	10 1/2	Leasco Computer Leasing	+ 1/4	+ 1.20	+125.00
AMSE	45 7/8	86– 41	77 1/4	• Levin-Townsend Computer Corp.	– 3 1/4	– 4.19	+ 68.36
OTC	10 5/8	16– 7	12 3/4	• LMC Data, Inc.	+ 4	+ 45.71	+ 51.51
OTC	10 7/8	16– 10	11 5/8	• Management Assistance	– 3/8	– 3.13	+ 6.90
AMSE	41 5/8	83– 39	44 7/8	National Equip. Rental	– 4 7/8	– 9.80	+ 7.81
AMSE	38	64– 36	55 3/8	• Randolph Computer Corp.	– 2 1/2	– 4.32	+ 45.72
OTC	10 1/2	40– 10	42 1/4	System Capital Corp.	+ 3 3/4	+ 9.74	+302.38
AMSE	10 7/8	19– 10	16 3/4	U.S. Leasing	– 7/8	– 4.97	+ 54.02

• Stock split **Not available *Companies included in Computerworld's stock trading index for each sector.

Personnel Counseling and the Applicant

By A.L. Lemay

What can a personnel consultant do that you can't do for yourself? All of us have had to go through the ordeal of finding a job. Initially, all we had to do was knock on doors until we found something. As our careers develop, however, finding another job requires considerably more sophistication. A personnel consultant is a professional totally absorbed in finding the right position for the qualified applicant in the right environment. Professional employment firms can offer significant assistance in developing a mature search program for a position suitable to your level of skill and professional need.

Objectivity

A personnel consultant's major responsibility is to maintain an objective outlook and analyze your sincerity, your accomplishments, and your potential. He wants to know why you are looking and, more importantly, he wants to make sure that *you* know why you are looking. You should expect him to question your sincerity and to pursue a concern about your present employment.

Only after a close scrutiny of your background and experience will the consultant begin to grasp your short-range and long-range goals. *If his experience is substantial, the consultant should readily comprehend whether or not your goals are realistic.* He is interested in all causes of frustration within your current position. Such knowledge will help avoid a duplication of the same problems on the new job. Your technical competence, personality, and attitude play a major role in determining to whom the consultant will refer you. During these initial stages, absolute honesty is your major responsibility. You should keep your personal objectives flexible. If you do this, you may find an *opportunity* rather than just a *job.*

Timeliness

A fisherman has to be able to tell the signs of impending weather before he sets out into deep water. You are wise, indeed, if you can read similar signs which may forecast employment security, or lack of it. *The personnel consultant can assist you in knowing what to look for and how to interpret what you see.*

If you have exhausted the possibilities of your present position, and there is little promotional opportunity in sight, it may be time to move. It is the wiser course for you to make up your mind than to have it made up for you, either by your employer or by prevailing circumstances.

Do you have the foresight to know that *now* may be the time to move! If you come to the personnel consultant under pressure to find another job quickly – either because you are out of work or soon to be – you make it more difficult for the consultant to find you a satisfying job.

Read the signs properly with common sense and you will be able to present yourself to a consultant – and to a prospective employer – in the most agreeable light.

When you look for a position can sometimes be as significant as *where* you look.

When the counselor has made a realistic evaluation of your skills and needs, he is in a position to present your credentials confidently to an employer whose needs match your own and who requires your skills. It is this blending of objective knowledge of the applicant with knowledge of the particular demands of the company that make the professional personnel consultant an invaluable aid. Only he can be in such a position. *The consultant, acting as a disinterested third party, can offer direction to the company and guidance to the applicant.* The demand for success and satisfaction by both the company and the applicant acts as a check-and-balance for the personnel consultant. In establishing a professional relationship, no better principle of action exists.

A. L. Lemay

The personnel consultant is the middle-man between the employer and the applicant. Last week R.O. Roy, president of Ro-Mac & Associates, personnel consultants, Chestnut Hill, Mass., described what a consultant can do for the employer. In this article, A.L. Lemay, the firm's vice president, describes what a consultant can do for the job-seeker.

The subject of salary must arise. A personnel consultant knows the competitive salaries offered in the industry and can suggest a realistic asking figure based upon your level of skill and future potential.

Instruction

A personnel consultant can be of great help in preparing you for job interviews. Just as he can advise you on salary, the consultant can also provide knowledge of the company, its personnel policies and salary guidelines, and the kind of professional growth you might experience. Eliminating the minor questions so you can concentrate on the substance of the job, the consultant can give you significant information – a profile of the man you will talk with; details, pro and con, of the company; and awareness of your proper professional level.

When you decide to use a personnel consultant, make effective use of him. Rely on him for interview follow-up. A consultant, acting as an objective third party, must be honest in assessing your impact on the potential employer. With experience and knowledge, he can give you important pointers after the interview and constructive advice on how to present your qualifications in a more positive way. This kind of advice is most meaningful when you do not receive an offer or when the company's interest is wavering.

The main point of an employment search is to be ready to work hard at self-evaluation and to be prepared to have your sincerity, depth of motivation, and interests thoroughly probed. Only after you have evaluated your own circumstances and are confident that now is the time to move, is it advisable to come to a personnel consultant. The consultant's task is to assist you in finding a meaningful job. Only if you are willing to do your part will the consultant stand a chance of performing in your behalf. If the consultant is a professional and you are receptive to his counsel, your next position will undoubtedly be a step forward within your overall career objectives.

Working in concert, the consultant and the candidate can achieve their common goal – the employment opportunity which fulfills the current needs and future potential of the candidate.

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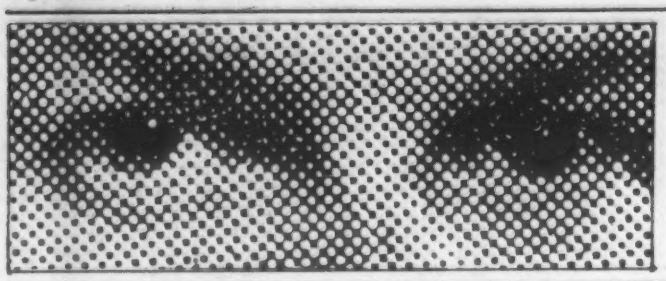

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Bad Communications Led to WU Suit

NEW YORK – Technical problems involving poor communication between computer specialists appear to be at the bottom of the successful Law Research suit against Western Union (CW June 12). Western Union thought that its computer was loaded to capacity with Law Research citations, and stopped inserting more. Lawyers then found that many relevant citations were not being given by the system, stopped using the service, and the whole thing became, as the judge called it, "a financial failure."

The basic problem involved the loading of the drum. Each citation had a reference which was used as the basis for an algorithm to find the drum address. The numbers which could be used as such references were supplied by Western Union to Law Research, but Law Research was not told that all the numbers had to be used sequentially. Law Research did not use the numbers sequentially, and was then told that the drum was full when this was not so. Even when this fact was learned after some months of partial operation, it was a considerable time before the loading process was restarted.

Whether the case will become "a landmark" is not clear at this time, but as Western Union lawyers chose not to enter any defense evidence, it is perhaps unlikely. However, relevant parts of the judge's eight-page opinion are reproduced here for general interest.

SUPREME COURT, NEW YORK COUNTY

Index No. 20092/1967

LAW RESEARCH SERVICE/INC., Plaintiff, against WESTERN UNION TELEGRAPH CO., R.W. McFALL, as President and Chairman of the Board of Directors, CHARLES de BRETTEVILLE, HARRY E. FIGGE, JR., WILLIAM D. GAILLARD, EUGENE M. GEDDES, LEONARD H. GOLDENSON, JOHN S. HUTCHINS, CLARENCE H. LINDER, W.P. MARSHALL, T.F. McMAINS, JOHN F. RICH, HARPER SIBLEY, JR., LOUIS YAEGER, Defendants.

IRVING L. LEVEY, J.:

This is an action by the plaintiff Law Research Service Inc. against defendant Western Union Telegraph Co., for specific performance and for damages in connection with two joint venture agreements allegedly entered into by the parties on December 17, 1965 and on March 16, 1966, for the delivery of legal citation data to all subscribers of the plaintiff's services in the U.S.A., through the facilities of the defendant.

Plaintiff alleges various defaults and failures by the defendant in the performance of its assumed obligations under these agreements, all of which are vigorously denied by said defendant.

In its counterclaim, defendant seeks a declaratory judgment to the effect, first, that the alleged agreement of December 17, 1965 is not an agreement in any sense of the word, creating no enforceable rights for either the plaintiff or defendant, and secondly, that the agreement of March 16, 1966 contains the only legal relationship between the parties, with its terms violated in numerous essential respects by the plaintiff.

The defendant having chosen to rest after plaintiff's case without offering any testimony, such testimony as was adduced in behalf of the plaintiff may be construed most strongly in its favor. The burden of proof, however, imposed upon the plaintiff to prove its allegations by a fair preponderance of the credible and believable evidence, has not been lessened in any degree by defendant's failure to produce evidence.

The principle issues are the validity or invalidity of one or both agreements.

Regarding the 1965 document, the plaintiff maintains that frequent preliminary negotiations resulted in this alleged compact consisting of 14 partially-typed duplicate pages, describing and outlining, generally, the arrangements theretofore discussed by the parties through their officers and aides.

On examination, however, it appears to be nothing more or less than a memorandum of intent on the evident assumption that the parties ultimately would enter into a formal contract.

The testimony further established that Mr. Perry, Director of Contracts for defendant, refused to sign the draft because he regarded it as beyond his authority.

Of signal importance, also, is the testimony that a copy of the draft had been removed from the desk of Mr. Perry's assistant and furnished, without authorization, by the defendant's employee Bodell to the plaintiff's president.

Furthermore, the alleged agreement which provided spaces for its execution by officers of the plaintiff and defendant and for attestations of both signatures was never signed by any of the officers or witnesses.

Finally, on two of the pages, changes and delineations were made and initialled by Mr. Bodell. This initialling, however, hardly merits or proves execution by the defendant, even though plaintiff urges that the said Bodell was "under the impression" that he had been authorized by the defendant's president to execute the contract.

It is abundantly clear that this alleged contract cannot be considered as binding on either party, particularly so since the plaintiff's president is regarded as an experienced, resourceful and able attorney who had conceived an ingenious and skillful method of supplying legal authorities to the entire profession in the United States. Could this talented lawyer, engaged in an undertaking of this magnitude, seriously consider as valid this unsigned outline? He was no newcomer in the business, legal, and financial world, and to urge that this unexecuted draft represented a binding accord between the parties is just simply incredible. At most, it constituted a bare description of a proposed agreement – indefinite, incomplete, and patently insufficient to satisfy the Statute of Frauds.

As to the contract executed in March 1966, which concededly was validly executed, plaintiff's effort to avoid its terms by charging duress is not supported by the credible and believable evidence. Mere economic pressure does not constitute duress sufficient to render a contract voidable.

Neither at the time of the execution of the 1966 contract nor at any time thereafter, until the commencement of this suit, did plaintiff make any efforts to disaffirm this contract. I have reached the conclusion that the 1966 contract must be deemed the only legally enforceable agreement between the parties, and the sole measure of their rights and obligations.

Now as to the breaches alleged by plaintiff for which damages are being demanded, just what did they consist of, and to what extent do the violations justify the relief sought?

Plaintiff did have complete responsibility for the preparation of the legal citation data which defendant was to store in its computer. Defendant had the corresponding liability for devising the method for programming by plaintiff.

Defendant furnished plaintiff with a formula or algorithm early in 1966 for the generation of octal digits to be employed by plaintiff in this programming, which was to serve a twofold purpose, one, as index numbers for citation data in plaintiff's computer thesauri, and two, as the "address" in defendant's computer memory drum.

The testimony reveals that in August 1966 plaintiff was depleting the octal digits due to the fact that plaintiff had not efficiently utilized them as generated from the algorithm, primarily because defendant had never advised plaintiff through schedules or otherwise, that these octal digits so generated had to be used sequentially.

Significantly, the requirement that octal digits be used sequentially neither appeared in the 1966 contract nor in any programming schedule promulgated by defendant, nor in Schedules A and B, the original operation schedules, referred to in the contract. Moreover, as conceded by defendant's officers, nothing in an algorithm, as such, required sequential numbering. This requirement, therefore, was peculiar to defendant's computer facility.

Defendant then refused plaintiff's requests for additional octal units based on an erroneous impression that the citation data theretofore furnished by plaintiff had exhausted the capacity of the entire computer drum apportioned to plaintiff's direction and disposal, at specified rates. Accordingly defendant demanded greater rates whereas the citation data supplied by plaintiff had never exceeded the allotment. Defendant was mistaken in its count because of plaintiff's failure to employ octal digits sequentially, resulting thereby in a waste of computer storage space. "Timely notice" of this condition was not given to plaintiff by defendant, as required by the contract, and as a matter of fact it was not until April 1967 that the plaintiff was apprised of its failure to use the octal digits sequentially. It was thereafter discovered that only one half of a full computer drum was required to accommodate the data supplied by plaintiff up to August 1966.

It was also developed at the trial that defendant agreed in April 1967 to reload the computer drum without charge to the plaintiff so that wasted space could be utilized but this, in turn, resulted in even further delay in the furnishing of plaintiff's service to its subscribers. Between August 1966 and April 1967, plaintiff had been unable to publish its thesauri or program its citation data for additional states or to load more material in defendant's computer.

Because of these delays, not all of which could be attributed to plaintiff's "ineptitude", as urged by defendant, the volume of inquiries fell far below that which plaintiff had agreed to generate in the contract.

These actions or failures to act on the part of the defendant, may well be regarded as breaches of its obligations.

A second item of breach involved billing. No billing tapes were furnished by defendant until November 1966. Since inquiries for citation data went directly to the defendant, without notification to plaintiff, the plaintiff remained in the dark about such matters, although under the contract notification was provided for. To a degree, defendant did explain its failure by alleging that plaintiff's equipment was not programmed in the computer language in which defendant's billing tape was transcribed.

Still another breach urged by the plaintiff was the attempt of defendant, in September 1967, to drastically advance its price schedules. Plaintiff maintains that there were certain conditions precedent to any increases, but no justification for the arbitrary action here pursued by the defendant.

Finally the record discloses that the legal citation service, as contemplated by the parties, has been financially unsuccessful, but the reasons therefor cannot be imputed to the defendant exclusively. Both parties were somewhat at fault and this too is a factor in the petition by plaintiff for specific performance.

Plaintiff, I have concluded is not entitled to specific performance of the 1966 contract since the services involved are not that unique as to warrant this relief. Other means are available to the same end.

Also, defendant, because of its breaches, is not entitled to a declaratory judgment, terminating its contract with the plaintiff, even though plaintiff may be guilty of defaults in payments, and in the paucity of transactions generated by the service.

I have reached the conclusion that the sole issue which remains for determination is the assessment of the damage occasioned by defendant's non-performance in connection with the contract.

The proof offered by the plaintiff, however, lacked such preciseness that it appears to be in the interest of substantial justice that this subject of damage be set down for additional testimony.

Counsel for the respective parties, therefore, are directed to contact this Court's chambers to make arrangements in this direction, the entry of final judgment abiding the event.

Dated: May 27, 1968

Acquisition Could Make 'Partners' of CDC, RCA

MINNEAPOLIS, Ind. – Control Data Corp. has agreed to acquire Commercial Credit Corp. of Baltimore, Md., through a share exchange. The proposed transaction would have an indicated value of approximately $579 million.

CCC, one of the largest independent finance companies in the nation, is currently the target of a take-over bid, which CCC management has been fighting, by Loew's Theatres, Inc.

In addition, CCC and Radio Corporation of America announced in late January that they would form a new company to establish and operate computer centers in principal cities across the nation for time sharing and data processing service using RCA equipment. The first center is scheduled to open in Baltimore later this year.

If the proposed CDC-CCC merger goes through, it would appear that CDC and RCA, both competitors in the computer manufacturing field, would own shares in the new time sharing company.

The proposed CDC-CCC merger, described by officials of both companies as "a substantially tax-free reorganization," will be voted on first by a special CCC director's meeting and then at special stockholder meetings on dates to be set.

Loew's has announced that despite the proposed CDC-CCC merger, it will continue with its tender offer of April 25 to purchase CCC stock. Loew's has said that prior to making public its tender offer, which expires June 28, it owned more than 10 percent of CCC's outstanding stock.

Under the proposed CDC-CCC merger, CCC stockholders would receive one-third of a share of CDC stock, plus a six-year warrant to purchase 0.1 shares of CDC stock in exchange for each CCC common share.

Under the proposed Loew's offer, CCC stockholders would receive Loew's debentures convertible in one Loew's common stock for each two CCC shares held. The debentures would be convertible at any time in Loew's common stock at one share for $90 of debentures, redeemable at 110% through June 30, 1971, and at prices declining to 100% from July 1, 1971 through 1993.

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Impact of LSI On Computers Is IEEE Topic

LOS ANGELES – Three computer scientists turned policy-makers will discuss the impact of large scale integration (LSI) on the next generation of computers at the closing session here of the Institute of Electrical and Electronics Engineers Computer Group Conference June 27.

Max Palevksy, president of Scientific Data Systems, J. Presper Eckert, vice president of Univac and co-inventor of the first electronic computer, and Brian Pollard, engineering manager of RCA, will discuss developments in the field, especially those reported during the three-day conference, and assess their impact on the next computer generation. The session will be chaired by Gerhard L. Hollander, president and technical director of Hollander Associates of Fullerton, Calif.

Some people believe LSI will make possible the inexpensive home computer or the pocket computer. But businessmen must view these new developments far more realistically. Even though cost can be reduced by a factor of 1000 over the early tube computers and by a factor of 10 over existing computers, practial limitations may make these large savings unattainable unless the market for computers is broadened far more than expected.

The 1968 IEEE Computer Group Conference, to be held from June 25 through June 27 at the International Hotel in Los Angeles, will examine the impact of large scale integration on the computer field.

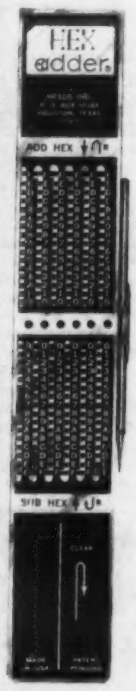
Drum Memory Is Adaptable For I/O and Direct Access

Magnafile drum memory

Medium scale integrated circuit logic has been utilized in a drum memory system designed to meet the storage requirements of small computer systems. The basic memory configuration of the Model 8403 is equally adaptable to I/O or direct memory access applications. The unit provides a 1.1 million bit data base with 64 tracks and an average access time of 8.5 or 17 milliseconds. Magnafile Inc., 2987 West Fairmont, Phoenix, Ariz. 85017.

Hexadecimal Calculator

A hexadecimal calculator helps programmers debug third generation computer programs. The pocket-sized Hexadder accommodates the base 16 numbering system, and addition or subtraction of two or more hex numbers allowing sums up to "FFFFFF" to be performed. Made in all-aluminum design, the calculator measures 9-1/2 x 1-1/2 x 1/4 inches. Price is $15 each for prepaid orders; purchase orders require an additional handling charge of $2.50 per order. Hexco, Inc., Houston, Texas.



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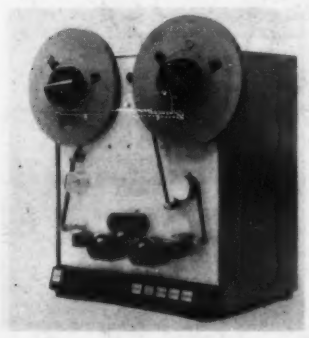

Cybertronics tape cleaner

New Products

Acoustic Coupler

A portable originate/answer acoustic data coupler allows the user of computer time sharing to communicate in the "originate" mode with a time sharing computer from a remote location over ordinary telephone lines and in the "answering" mode. Designated the ADC 300, it is compatible with the 103-A Dataphone at one end of the line or with the ADC 260 "originate" mode acoustic portable data coupler. Data rate is 300 BAUD. Reliability is comparable to fixed line equipment. Complete terminals are provided. Anderson Jacobson, Inc., 2235 Mora Dr., Mountain View, Calif. 94040.

Documentation Binder

A program documentation binder of one-piece construction has been designed for programmers. The binder is suitable for systems in which the source documents, cards, and printout are of a size that can be housed in a single unit. Included are vinyl envelopes for control cards and an index with printed insertable EDP titles. Wilson Jones Co., Division of Swingline Inc., 6150 Touhy Ave., Chicago, Ill. 60648.

Tape Cleaner

An automatic magnetic tape cleaner with a low pressure cleaning cycle for newer tapes and a high performance process for older magnetic tapes, is designed to meet rehabilitation requirements for 9 channel and full width tapes. The E-24 has a self-adjusting wind control for continuous tension through the rewind cycle. Cybetronics, Inc., 132 Calvary St., Waltham, Mass.

Memory Systems

A new series of 108 three-microsecond core memory systems with word capacities to 4096, in bit lengths up to 18 bits per word, has been announced. Prices start at $2000. Storage capacities of the FI-3 series are from 1K x 6 bits to 4K x 18 bits. Cycle time is three-microsec. (2-microsec. half-cycle time), and access time is one microsecond maximum. The system utilizes integrated DTL circuits and silicon semiconductors mounted on PC cards. Units are available with address register, sequential counter, and memory retention. Ferroxcube Corp., Saugerties, N.Y.

Anderson Jacobson acoustic coupler

Wilson Jones documentation binder

Tape Recorder

The Model 1300 incremental tape recorder, with prices starting at $2590, will record synchronous data of rates from 0-300 char/sec to 0-1200 char/sec; 7 track or 9 track, 200, 556, or 800 bpi. It is compatible with IBM 360. Digi-Data Corp., 4315 Baltimore Ave., Bladensburg, Md. 20710.

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